A Study of Questioning

BY

SOSHICHI YAMADA

Clark University

A DISSERTATION SUBMITTED TO THE FACULTY OF CLARK UNIVERSITY, WORCESTER, MASS., IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY, AND ACCEPTED ON THE RECOMMENDATION OF WILLIAM H. BURNHAM

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A STUDY OF QUESTIONING*

By Soshichi Yamada, Clark University

Preface

Since Socrates the question method has occupied a prominent place in the technique of instruction. "To question well," says De Garmo (19. p. 179), "is to teach well. In the skillful use of the question more than in anything else lies the fine art of teaching." Indeed, "the art of correct questioning has a highly significant effect upon the mental development, ..." (32. pp. 331-332.)

To-day more than two-thirds of the school time is occupied with questions and answers; but unfortunately the general assumption that we know by intuition when and how to ask questions kept investigators from the study of the psychology of questioning until the dawn of this century when the genius of Alfred Binet inspired him to attempt the solution of the problem (6. p. 244). Naturally the majority of teachers whom we hire to put questions to our children ask questions for months and years without ever knowing the psychology of what they are doing, hence without ever taking into account what mental changes a question calls forth, what emotional states it arouses in the pupil's mind, how such resulting states influence the course of ideation and thinking, and so forth. If the teachers do not know anything about these changes, they are not qualified for teachers. Thus it is of prime importance for educators to study the influence of questioning upon answers and upon the mental development of the child.

* The writer wishes to express his hearty thanks to Drs. W. H. Burnham and Theodate L. Smith of Clark University and to Messrs. Vermille and Butler, principals of the Dix St. and Edgeworth St. schools, for their advice and assistance in this investigation.

General Introduction

The question rightly used is a medium through which a teacher comes into the closest touch affectively with her pupil. The pupil's reaction-time and the mode of reaction to the given question will reveal his mental type and characteristics; for instance, whether he is of visual, auditory, motor, or mixed type; whether his temperament is sanguine, phlegmatic, melancholic, etc.; or again whether he is able to impress something upon his mind (memory) with ease or difficulty, whether he forgets quickly or slowly, whether he can retain a great mass of ideas or only scanty fragments; etc. All these analytical observations are the indispensable task of a teacher in real dynamic education; for this knowledge alone will furnish the principles of individual psychology. Care, however, should be taken that the observations be made scientifically. The teacher, through such diagnosis, will discover technique for further questioning. The question is, thus, a tool for psychological analysis and diagnosis.

Pedagogically, the purpose of questioning is manifold.

1. It is to awaken the pupils to self-activity, to stimulate them to think. It gives a teacher an opportunity for directing and training the thought processes of her pupils.

2. It is to cultivate the fine art of good expression. A habit of clear, concise and discriminating enunciation and of an agreeable intonation is one of the most attractive and highest gifts which any teacher can bestow upon a child.

3. It is a means of testing the depth of the pupil's mind. Through a series of skillful questions, the teacher brings to light the strength and weakness of his knowledge, so that she may find out his intellectual status.

If the aim of the question is to train the processes of thought and expression, what will be the result when a teacher, in one class period, say, of forty minutes, asks over eighty questions (65. p. 11) and gets as many answers? What chance can there be for orderly association and deep accurate impression of ideas, or for a complete expression of thought? Furthermore the nervous tension of the pupils under such a pressure must be considered. A new science of school hygiene has arisen which is dealing with the problem of the physical as well as mental conditions of children in order that they may be able to do more work without injury. But the question as to whether the children may not make better progress in orderly association, originality, and preciseness of thought and expression, if given more freedom and time for thinking and expressing their thought as they have when engaged in their own activities, has not yet received due consideration. Time is

required to digest impressions and translate them into clear and definite ideas. Will not a "lack of time and leisure conduce to habits of speedy, but snapshot and superficial judgment?" (20. p. 37.)

I do plead for the millions of the children who now live in agony the school years of their lives because of this dragon of misguided questioning now so universally rampant in our schools. "Every question," says Matthias (41. p. 79), "must strengthen the mental power of the pupil, sharpen his understanding, advance his knowledge, develop his speech-power. Hence one should not put any question, in which the pupil needs to think nothing or little," nor should questions be asked without giving sufficient time for purposive thinking and a complete expression of thought. Is it, however, possible to acquire the art of questioning by practice? It may be a possible attainment with practice of the most intelligent sort, but mere practice, blind and mechanical, however enthusiastic a practitioner may be, will never attain the desired end. Thousands and thousands of teachers practice questioning hourly and daily, year after year, and yet are no better off than when they began. The art of questioning can not be mastered without an accurate knowledge of its fundamental principles. In other words, mere practice is not sufficient to teach one the psychology of questioning.

From this pedagogical and psychological point of view, the writer has studied the relation between question and answer.

Experimental Results

The study of the psychology of questioning is very recent. Since Binet (6. pp. 244-324) attempted the solution of this problem, there has followed a series of experimental investigations among which the studies of Stern, Wreschner, Lipmann, Lobsien, and Borst are specially prominent.

Two methods have chiefly been used: the picture method (*Bildmethode*) and the objective method (*Wirklichkeitsmethode*). In the first the presentation of pictures, in the second objects or events of real life, are used as material in regard to which testimony (*Aussage*) is obtained in two ways: by "free spontaneous report or narrative" (*Bericht*) (62. p. 270) and by asking questions, the so-called "interrogatory" (*Verhö*) or Whipple's "deposition." Hereafter these German terms will be used.

Binet first used the picture method and tried to work out the mechanism of the personal influence of questions upon children. He began by addressing the children as follows:

"My friends, we are going to make an experiment, to dis-

cover if you have a good memory, a memory better than that of your comrades; I am going to show you a pasteboard which is here hidden behind that screen; on the pasteboard certain objects will be seen. I shall show you them for twelve seconds; twelve seconds, look at them attentively. It is a very short time, it is not a minute; a minute consists of sixty seconds; twelve seconds will pass by very quickly. It is thus necessary not to lose this precious time; make use of it in your observation of the objects very carefully, for as soon as twelve seconds elapse, I shall take the pasteboard away from you, and then I shall put a number of questions upon what you have seen. Many of the questions are upon the small details, and you are requested to answer exactly. Do you understand? Is it clear to you?" With this explanation, which, Binet says, has almost always had the effect to excite the curiosity and enthusiasm of the child, he showed the following six objects pasted on a card: a penny, a button, a stamp, a label, a photograph and a picture. The number of observers was twenty-five, all of the primary school, ranging in age from nine to twelve years.

Here the object was to provoke, in the observers, errors of the forced memory, and to discover the amount of error through imagination. Hence instead of asking their spontaneous description of each object, he first asked simply an enumeration of the objects and then put a series of questions, forty-one in all. The results were very poor compared with those obtained by other investigators, because of the very brief time of exposure. The percentage of the right and the false answers was 58.2 and 41.8 respectively. (6. pp. 262-269.)

Then the method of spontaneous narrative was tried, repeating the same test upon a different group of children without asking any questions, that is, the children simply wrote what they saw and remembered, the only recommendation being not to be contented with naming the objects, but to describe all the details. The number of the pupils tested was twelve, all of the upper class of the primary school, with the same conditions as far as possible. The results were: two pupils committed no error; two committed one error; one committed two; four, three; and three, four errors; while in the experiment of the forced memory, the minimum of error was five and the maximum was thirteen. (6. pp. 262-269.)

It is extremely probable that, if one forces the memory by suggestion, one may provoke a great number of errors. Thus Binet made three more tests by the use of the written questions. The same objects were shown as before. A number of children of ages nine to twelve were divided into

three groups and each group received a different set of the questions. The first was intended to force memory, *e. g.*, "How is the button fixed?" The second was intended to produce a moderate suggestion, *e. g.*, the form of the questions was suggestive of false affirmation, for example: "Isn't the button fastened with thread?" The third gave a strong suggestion, *e. g.*, "What is the color of the thread which passes through the holes of the button and fixes it to the card?"

As Binet expected, the majority of his observers accepted suggestions and answered as if the memory images had been true and spontaneous as is seen from the following table. (6. p. 313.)

Questionnaire		Questionnaire		Questionnaire	
I		II		III	
5 children		11 children		11 children	
r	f	r	f	r	f
8.1	2.9	8.09	4.9	5.09	7.9
73.6%	26.4%	63.3%	37.7%	39.2%	60.8%

In this and the following tables,
r equals number of items rightly reported;
f " " " falsely "
u " " " uncertain "

The surprisingly high percentage of the errors in case of the third questionnaire shows how few of the children have sufficient independence of thinking and will-power to acknowledge and refuse the false suggestions. Twelve normal school students made the same kind of errors as the children did, though not so gross. (6. pp. 325-329.)

Binet concludes as follows: A full and concise report may be made and yet be false. (6. p. 285.) The experiment of the forced memory is subjected to error more than that of the spontaneous memory (6. p. 294). The method of suggestion by the written questions is powerful enough to influence not only children under twelve, but also young people of eighteen years of age (6. p. 329), and more so with the oral questioning. Hence if you desire a faithful testimony from a child, you must not ask him any question, nor command him to make an oral report, but require him to write spontaneously what he knows, since children are, even at the age of twelve, still incapable of distinguishing between fact and fiction or

invention by imagination and reasoning. "How many adults are not grown up children in this respect!" adds Seashore in his review of Binet's "*La Suggestibilité.*"

Following Binet, Stern performed several experiments on the same problem. One of them was carried out in the year 1902 with forty-seven observers of from seven to nineteen years of age of both sexes. After an introductory statement, almost the same as Binet's, Stern hands a picture, well known now as the *Bauernstube* (peasant room) to the observer to look at it attentively in bright day light for one minute, after which period he takes the picture away and asks the observer to describe what he has seen. If the observer begins to hesitate in his explanation, the experimenter says quietly: "Think of it; something may probably come to you yet." If the observer is again silent, the experimenter asks: "Does nothing occur to your mind any more?" Upon the answer: "no," the experimenter goes on: "Now I shall ask you a little more, and certainly something will come to your mind. But if you do not know any answer to the given questions, just say: 'I do not know.' It will not harm you at all, even if you do not know." Stern allowed one minute for observation in order that a thorough comprehension and better recollection might be obtained. The resistance to falsification through suggestion was thus increased. Twelve suggestive questions were mixed with the indifferent questions to divert suspicion, and the suggestive questions were, like the second questionnaire of Binet, purely "questions" that suggested the answer "yes." Each question including the suggestive one was asked only once in the most indifferent tone, and answered orally. The results are shown in the following table. (58. pp. 295-321.)

	r	f	u	$\frac{r}{r+f}$	$\frac{f}{r+f}$
				%	%
Bericht.....	24	1.5		94	6
Verhör.....	35	17.1	6.7	67	33
	in %	in %	in %		
Normal q.....	66	26	8	72.7	27.3
Sugg. q.....	59	25	16	70.7	29.3

Thus Stern concludes that errorless testimony is not the rule but the exception; that the *Bericht* is far more trust-

worthy than the *Verhör;* that every question has a suggestive influence; etc.

Ranschburg (48), with thirty feeble-minded children of ages from eleven to seventeen; Rodenwaldt (50), with fifty soldiers of from nineteen to twenty-three years of age; and Revesz (49), with twenty-six morally depraved pupils ranging in age from nine to fifteen, made experiments after the same method and with the same picture Stern used; Oppenheim (45), with thirty girls of from ten to twelve years of age, in 1904, with three pictures named *Bauernstube, Feld,* and *Wasser,* after Stern's method, and Breukink (11), with 108 adult observers repeating the experiment of Oppenheim,—obtained similar results. In the experiments of Oppenheim questions and answers were given orally, while with Breukink they were in written form. The former experimenter, from the second test on, encouraged her observers to do better work, telling them that many false answers had been given. This, undoubtedly, warned the observers against the influence of the questions, especially against the suggestive ones, so that a better result was obtained in the later than in the earlier experiments. The educability of children in the giving of testimony is clearly observed in both cases.

Wreschner (70), dissatisfied with the method of Stern in regard to the *Bericht,* used his own method, the so-called examination-method (*Prüfungs-methode*). According to his explanation, its chief characteristic is that exactly specialised themes for testimony are given to the observers; it has the advantage of making conditions similar for all observers, and obtains an equal number of statements (*Angaben*) from all observers, so that the number of the statements, omissions and errors can be exactly calculable, etc. He notes that this method is closely connected with the *Verhör,* but he seems rather to ignore or at least to disregard its suggestive influence, as well as that of the usual interrogatory method. He used a picture called "*Grossvater*" with nine observers. A spontaneous report was given immediately after an observation of one minute; the second was given after seven days; and the so-called examination-method was used after seven days for four observers and also after seventeen days for the other five observers (70. p. 174). The results by this method also were similar (70. pp. 174-5).

Thus it is seen that the examination method like the *Verhör* raises many statements from latency into actuality, but, at the same time, it produces many errors, undoubtedly due to suggestive influence caused by narrowing the conscious field.

Borst (9 and 10) who followed partly Wreschner's method so that there were supposedly no suggestive questions in her experiments, though there were in reality such; Cohn and Gent (17), with and without distraction of attention during the observation of the pictures; and Dieffenbach (16) with ninety-eight observers of ages from seven to twenty, obtained results similar to those already given.

We now turn from the experimental results by the picture method to those of the objective method (*Wirklichkeits-methode*) and cite a few of the results. In the winter of 1903 and 1904 an experiment was made by Stern (61) on the students in his psychological seminary at the University. The procedure was as follows: A gentleman steps into the seminary, wishes to talk with the lecturer (Stern), hands the latter, with a few words, a package of manuscript, asks the latter's permission to make use of the library in the seminary-room, takes up a book, goes out after five minutes taking the book with him and is asked by the lecturer (Stern) to wait outside for the latter until the close of the seminary." The number of the observers were fifteen, six women teachers and nine students. After eight days the *Bericht* and *Verhör* took place in writing. The result (61. pp. 17-22) was: With the *Bericht* the true statements amounted to 75% and the false statements to 25%; with the *Verhör* 50.5% and 49.5% respectively.

So, too, in the summer of 1904, Lisst (36) with twenty-two students, and Rohde (51) in 1907 with neuropathological but mentally sound patients, arrived at conclusions similar to those of Stern.

Suggestibility has hitherto almost always been investigated by introducing suggestive questions among the normal questions and by a comparison between results obtained through the normal and suggestive questions. This method is not entirely trustworthy, since the suggestive questions may refer to different objects, and the different objects are not retained in memory with equal clearness. (35. pp. 418 ff.)

This criticism may be avoided, if one investigates the memory for one and the same object by differently formulated questions. But naturally these different questions can not be addressed to one and the same person, hence one must put them to different persons as follows: The questions about an object (1): to the person (A) in the form (a), namely without suggestion, to the person (B) in the form (b) or with simple suggestion, and to the (C) in the form (c) of strong suggestion. This way Binet (6. pp. 296 ff) proceeded. But it may be objected that different persons are asked different

questions. This objection can, however, be avoided, if one asks further questions about the object (II): to the person (A) in the form (b), to (B) in the form of (c) and to (C) in the form of (a); and further about the object (III): to (A) in the form of (c), to (B) in (a) and to (C) in the form (b).

With this in view, Lipmann and Wendriner (35. pp. 418 ff), in the year 1904, made an experiment on twelve children of ages from four to six, using the picture called the '*Bauernstube.*' The questions were of three kinds, namely, group (a) was without suggestion, group (b) of an expectant nature, and group (c) contained strong suggestion and was composed of hypothetical and incomplete disjunctive questions. Each child was asked three questions of each group. The results were with group (a), the right statements amounted to 94% and the false to 6%; with group (b) 75% and 25% respectively and with the group (c) they were 44% and 56% respectively. Because of the testimony by too small children, we can not draw any ultimate inference from such results, but still we can see a general relation among these different questions. Lipmann (33) later made an extensive experiment which gave the writer much valuable material which will be referred to later.

There are two more important investigations on questioning, one by Franken (22) in 1911 and the other by Bader in 1912. Franken considered the report not only as a product of the intellect, but also of will. With this in view, he tried to test the educability of the power to report in children, that is, whether children can be taught to be more careful in stating that they do or do not know this or that thing. His subjects were 150 pupils from eleven to thirteen years. He arranged 200 questions relating to data in history, geography, etc. into two series: one as decisive and the other as determining questions. The first 100 questions begin with the words: "Do you know" so as to be answered merely by "yes" or "no;" for example, "Do you know on what river Lyons is situated?" The second hundred questions are so formed that a specific answer is to be given directly, for instance, "On what river is Lyons situated?" Among other results he found that by this means the pupils can be made more cautious in their answering, though the false answers can not be fully eliminated. Some of the other results will be referred to later on.

Bader's experiment (3) was to investigate the influence of the question, on reaction-time, the quality and quantity of an

answer, etc. He used the following nine different forms of questions or rather stimulus words for reactions. (3. pp. 3-4.)

1. What is the activity of the person designated by the stimulus word? Stimulus word: "soldier"—answer: "Marching."

2. What idea stands in a customary relation with the number given as a stimulus word? Stimulus word: "Seven" —answer: "Week." And so on. His results are very interesting and agree with the writer's view formulated before reading his article.

To sum up, the chief points of the results obtained by all these experimenters in regard to testimony and questioning are:

1. The errorless report is more frequent in the *Bericht* than in the *Verhör,* though it is the exception and not the rule.

2. The false statements of the *Bericht* are from one-half to one-sixth of those of the *Verhör.*

3. The range of the *Verhör* is far greater than that of the *Bericht,* but at the same time it is accompanied by an increase of errors:

4. Hence the *Bericht* is far more trustworthy than the *Verhör.*

5. The report given in reply to normal questions is generally far more trustworthy than that to suggestive questions.

6. The ability to report is educable to a certain extent by practice, warning, or correlation.

It should, however, be noted that the results above enumerated are merely the average of greatly diversified individual reports, and hence show neither any standard nor any rule for individual ability.

The Writer's Experiments

As a result of their experiments, Binet, Stern and others concluded that a spontaneous report should be asked first and then an interrogatory be given as a supplement to the former, since if questions are asked without a *Bericht,* there is great danger of falsification of memory induced by the questions which may not be eliminated later on by any means. This is certainly true, but none of these authors have shown how far this is true.

1. They demanded the *Bericht* first and then the *Verhör,* and failed to find out what influence the *Bericht* has on what has been given in the *Verhör,* that is, what would be the result, if the *Verhör* were given first and the *Bericht* followed.

2. Their questions were on points not reported in the *Bericht,* that is, the questions were not on every point concerning the facts under consideration but only on the omitted ones. Although Miss Borst did this, she as well as others ignored or rather failed to find what influence the succeeding *Verhör* had upon what had been reported in the *Bericht.*

These two points are very important for the formulation of any rule in regard to the order or place of the *Bericht* and the *Verhör* in the report as a whole.

With these points in view, experiments were undertaken to determine whether or not the results obtained by the other investigators are applicable in any way to the subject matter in our school curricula.

Only the following points are considered in this paper.

1. What is the relation: (1) between the *Bericht* given first and the *Verhör* following; (2) between the *Verhör* first and the *Bericht* succeeding.

2. What is the relation between normal and suggestive questions?

3. What is the relation between questions suggesting the right answer and questions suggesting the wrong answer? Here by suggestive questions we mean the so-called expectant as well as the 'yes or no' questions.

Method of Experiment

As our interest is in practical application, we selected our materials from Frye's Grammar School Geography and Adam's Commercial Geography; the section on the Surface of South America and the section on the Guianas. (See appendix.) The experiments were carried out at two different times, one, at Dix Street School, in February and the other at Edgeworth Street School, in April, 1913, at Worcester, Mass. Both were partly conducted by the teachers of each class and partly by the writer personally, but always under the writer's guidance.

In the first experiment the number of pupils was ninety, twenty-one from grade 7-1, twenty-seven from 7-2, twenty-six from 8-1, and sixteen from 8-2; but three of grade 7-2 and one of grade 7-1 are not included in our numerical calculation, as they did not finish their work in time. In the second experiment, forty-four pupils took part: eleven from grade 7-1, ten from grade 7-2, thirteen from grade 8-1 and ten from grade 8-2. Both of 8-2 were given the section on the Guianas as subject-matter which they reviewed silently for ten minutes

before the *Bericht* and the *Verhör* were required; the rest of the pupils were given the section on the Surface of South America which they reviewed about six to seven minutes before the *Verhör* or the *Bericht* was required. The time for the *Bericht* was about fifteen minutes and that for the *Verhör* about twenty minutes. The pupils of both grade 7-1, and those of grades 7-2, 8-1, and 8-2 in the second experiment answered the *Verhör* first and then gave the *Bericht;* and those of 7-2, 8-1 and 8-2 of the first experiment gave the *Bericht* first and then replied to the *Verhör*. In the experiment when the *Verhör* was given first, care was taken to erase the questions entirely from the blackboard before the *Bericht* was demanded, and also to make clear to the pupils that they should report again all that they knew on the subject in the *Verhör*.

The suggestive questions were formulated according to Lipmann's advice, that is, different forms of the suggestive questions were asked on the same subject-matter but to the different observers so that the suggestiveness of the questions might be compared. The pupils of grade 8-1 in the second experiment were not asked suggestive questions but the normal questions. During the experiment every precaution was taken not to give any suggestion whatever.

Numerical Calculation of Data

The following device for estimating our data was adopted, after various methods had been tried, as giving the fairest treatment:

A. In regard to the data on the Guianas.

1. A complete answer to each question was credited as one point.

2. An answer that gave one datum where a question demanded two data was counted as half a unit.

3. Answers to some of the questions (such as 11, 12, and 14. See Appendix.) were not demanded in full. If a pupil gave two names of the products or goods for exportation or importation, he was credited one point, if he gave only one name, he was credited half a point.

These regulations were followed in estimating the data in the corresponding *Bericht*.

B. As to the data regarding the Surface of South America.

1. A fact involved in each question was counted as one unit.

2. In the corresponding *Bericht*, the same rule was applied, but here a few exceptions were made.

a. If a pupil reported: "The vast forests in the Amazon river basin are called Selvas," he was awarded two points, since this report contained two facts corresponding to two questions in the *Verhör;* but if a pupil reported: "The vast forests in South America are called Selvas," he received only one point, as it gave only one fact.

b. If a pupil reported: "The Andes highland lies along the west coast of South America, he was credited with two points, though this answer, strictly speaking, is not complete, since it is important to know that the Andes is the primary or greatest highland.

c. If a pupil stated: "There are three plains called pampas, llanos, and selvas," he was credited one point, since some pupils thought that selvas meant a grassy plain in the south, while pampas meant a forest in the Amazon basin, etc.

As a whole these were the only difficulties, and so few in number that any alteration in the crediting caused but a small fraction of change in the percentage. The question naturally arises: Does not the pupil make any statements in the *Bericht* in addition to those contained in the sections employed for the experiment? To my surprise only five such statements intruded into the spontaneous reports: two pupils added "Plata river;" another two "Orinoco river" and one "Guiana highland." These five points were credited, if the statement was clear.

Results

Our results are as a whole very similar to those obtained by the other investigators as the following tables show. That is, our results show that the *Verhör* gives far greater range of report in quantity, but much worse in quality than the *Bericht*. It is, however, to be noted here that while this is always true of the general average, it is by no means true of each individual. Five pupils made no errors in either the *Verhör* or the *Bericht*. Tabulating the reports of the normal questions, we have fourteen out of 130 pupils who obtained the full credit for every one of the questions. In both spontaneous reports it is rather surprising to find that ninety-five out of 130 pupils committed no errors.

RESULTS OF FIRST EXPERIMENT

	Grade 7–1					Grade 7–2				
	r	f	u	$\frac{r}{r+f}$	$\frac{f}{r+f}$	r	f	u	$\frac{r}{r+f}$	$\frac{f}{r+f}$
Bericht.....	6.4	.14		97.7	2.3	5.8	.35		94.3	5.7
Verhör.....	18.3	4.1	1.6	81.6	18.4	18.3	4.2	1.5	81.3	18.7
Normal q...	12.4	2.4	1.2	83.8	16.2	12.5	2.3	1.2	84.4	15.6
Sugg. q....	5.9	1.76	.34	77.	23.	5.6	2.1	.3	72.7	27.3

	Grade 8–1					Grade 8–2				
	r	f	u	$\frac{r}{r+f}$	$\frac{f}{r+f}$	r	f	u	$\frac{r}{r+f}$	$\frac{f}{r+f}$
Bericht.....	5.2	.35		93.7	6.3	5.8	.2		96.6	3.4
Verhör. ...	17.9	5.	1.1	78.1	21.9	13.4	2.1	1.5	86.4	13.6
Normal q...	12.3	2.9	.8	81.	19.	8.5	1.1	1.4	88.5	11.5
Sugg. q....	5.6	2.15	.25	72.2	27.8	4.94	1.	.06	83.1	16.9

In the above table, with grade 7-1, and in the following table on the next page with all grades the *Verhör* was given first and then the *Bericht,* while with all the rest the *Bericht* was given first and the *Verhör* followed.

RESULTS OF SECOND EXPERIMENT

	Grade 7–1					Grade 7–2				
	r	f	u	$\frac{r}{r+f}$	$\frac{f}{r+f}$	r	f	u	$\frac{r}{r+f}$	$\frac{f}{r+f}$
Verhör....	19.	4.1	.9	82.2	17.8	19.8	3.65	.55	84.4	15.6
Bericht....	7.7	.54		93.4	6.6	8.1	.6		93.1	6.9
Normal q..	13.18	2.36	.46	84.8	15.2	13.8	1.85	.35	88.1	11.9
Sugg. q....	6.2	1.5	.3	80.5	19.5	5.9	1.8	.3	76.6	23.4

	Grade 8–1					Grade 8–2				
	r	f	u	$\frac{r}{r+f}$	$\frac{f}{r+f}$	r	f	u	$\frac{r}{r+f}$	$\frac{f}{r+f}$
Verhör....	18.3	4.1	1.6	81.7	18.3	13.05	3.1	1.85	80.8	19.2
Bericht....	6.	.4		93.7	6.3	5.1	.1		98.	2.
Normal q..						9.1	1.55	1.35	85.4	14.6
Sugg. q....						4.3	1.5	.2	74.1	25.9

I. *Relation between the Bericht given first and the succeeding Verhör.* A certain number of the statements given in the *Bericht* were altered rightly or wrongly in the succeeding *Verhör* as follows:

CORRECTIONS

Pupils	r to f	r to u	f to f	f to r	f to u
7–2 (7 pupils).....	7	3	3	2	
8–1 (11 pupils).....	16	4	3	4	
8–2 (6 pupils).....	3	6			2
Total.....	26	13	6	6	2

In other words, thirty-nine correct statements out of the total 402.5 given by the sixty-six pupils in their *Bericht* were changed wrongly in the succeeding *Verhör* by twenty-four

pupils. For instance, in the *Bericht,* two pupils reported that the Andes highland lies along the western coast of South America, but in the *Verhör* they answered question 7, "the Brazilian highland." Another boy and girl reported that the Amazon river flows from the Andes highland and is the largest in the world, but they answered question 15, "from the Brazilian highland." Some pupils reported in the Bericht, "the coast of South America is not as irregular as that of North America," but they answered question 3, b, with "yes, it is as irregular as that of North America." Two girls of grade 8-2 reported that the British and Dutch planters plant coffee and cocoa in place of the sugar-cane because the price of cane-sugar has declined, but they failed to answer question 5. On the other hand, six of the total 18.5 false statements in the *Bericht* remained false in the *Verhör;* the other six of the 18.5 false statements were corrected by the questions in the *Verhör;* while the other two were changed to the answers: "I don't know." Thus we may justly infer that the *Verhör* is more likely to make the right statements of the *Bericht* false than to change the wrong statements to right ones.

The question naturally arises here: Why should questions as a whole have such an influence even upon what was given correctly in the *Bericht?* The reason which we shall discuss later on may be stated here briefly as follows: The pupils are now questioned after they have given what they thought true and correct, and this inquiry draws their attention to the idea so intensely that it rouses in their minds an element of doubt and causes them to become more suggestible.

II. *Relation between the Verhör given first and the Bericht following.* To determine this has never been undertaken by any of the investigators. It becomes thus one of the chief points of interest in our experiments. We said as a result of the experiments hitherto performed that the questions influence our memory so much that any distortion right or wrong may not be eradicated later. From this it might be supposed that after a given lesson had been studied for a certain period of time, if questions be asked that cover each fact, one should be able to give a far better report in the succeeding *Bericht* on the same subject-matter than if asked to give a *Bericht* immediately after the study and before the detailed questions. Indeed the questions preceding the *Bericht* analyze the whole subject matter clearly into points and connect them with the questions so that they serve as a sort of resumé and may thus facilitate the succeeding *Bericht.* And to a certain extent this hypothesis is true, but not so completely as might naturally be expected. If we compare the results from grades 7-1 and 7-2

in the first experiment, which are most justly comparable, because the pupils were taught by the same teacher under the same conditions, we see only a slight difference; again the results from grade 8-1 in the second experiment, where no suggestive questions were used, and 8-1 in the first experiment, and from 8-2 in both experiments show merely slight betterment, although 7-1 and 7-2 of the second experiment show rather better work than any other.

Furthermore, the *Bericht* that followed the *Verhör* revealed a most interesting phenomenon: nine correct statements out of the total 478 given in the *Bericht* by the pupils of grades 7-1, 7-2, 8-1 and 8-2, were not answered by them, when questioned in the preceding *Verhör;* forty-five correct statements of the 478 were the correction of what was stated falsely in the previous *Verhör;* sixteen false statements of the 478 were the remainders of what was already given falsely in the *Verhör;* and three false statements of the 478 were the falsification of what was given rightly in the *Verhör*. For example: one girl answered, "no, it does not," to question 16, b, but in the succeeding *Bericht* she said that the surface of South America resembles that of North America. One boy answered the question 22 (what are the vast forests in Brazil called? Answer, selvas), with "They are called pampas," but in the following *Bericht* said: "The vast forests of Brazil in the Amazon basin are called Selvas."

These facts show clearly: that the influence of the *Verhör* upon the succeeding *Bericht* is rather slight, that the mental activity of the children in the *Bericht* differs from that in the *Verhör* where they are made abnormal and passive, being compelled by the external influence of the questions, while in the *Bericht* they are self-dependent, being free from any external compulsion; or in other words, we may say that the mental attitude of the pupils towards the *Verhör* is different from that towards the *Bericht*.

In regard to the so-called sequence or place of the *Bericht* and the *Verhör*, we are made a little skeptical about the statement that the *Verhör* should be subordinate to the *Bericht* as a sort of supplement. It is certainly better to ask the *Bericht* first and then give the *Verhör* on those points not stated in the *Bericht* so that any distortion of what was given in the *Bericht* may be avoided in the *Verhör;* but if our inference is correct, that is, if mental activity in the *Bericht* has a peculiar tendency to correct what was given falsely in the *Verhör*, then is it not also useful to demand a second *Bericht* after the *Verhör?* In school practice, and even in the court where we do not know

anything about the event, we may ask questions first and then demand the *Bericht* just as well as to give the *Bericht* first and then the *Verhör,* so long as there is no hypothetical, incomplete disjunctive and sequential question in the series of the given questions. The writer does not disregard the suggestive influence of questions by any means, but wishes to emphasize the significance of the mental attitude in the *Bericht.*

In order to avoid repetition, the rest of our results will be given in connection with the discussion of the other aspects of our problem.

Difference of Psychic Activities in the Bericht and the Verhör

Why is the *Bericht* always more trustworthy than the *Verhör?* Why is the range of the *Bericht* always far smaller than that of the *Verhör?*

The psychic after-effects of the impressions received in the observation are of various degrees of intensity, vividness and clearness. The things observed with interest and attention are apt to be most firmly fixed and thus be kept most clear, while those perceived inattentively or unconsciously leave behind only insignificant traces or none at all. (58. p. 329.) Intense, vivid and clear images or ideas lie always nearest to the threshold of consciousness waiting, so to speak, for the imperative impulse for self-expression to shake off the yoke of inhibition. Such ideas take precedence in the *Bericht.* In addition to these, the observers with more or less effort raise above the threshold many ideas of somewhat vague potentiality which have lost their clearness and obtrusive character in comparison with those of the first group, although still possessing sufficient persistence to come within the sphere of voluntary recollection (58). Hence the *Bericht* is not passive, but active in the highest degree. It is a more or less powerful and independent conscious selection of the most vivid and clear ideas in memory to which is attached the feeling of the greatest certainty and, above all, of spontaneity. Because of this will-activity with a feeling of spontaneity, any vague ambiguous and uncertain ideas are rejected. Consequently the *Bericht* is good in quality though unfortunately its range is small. This psychic activity in the *Bericht* can be further verified by the results of experimentation. Rodenwaldt gave his observers an opportunity to look at the picture again in order that their self-correction might be made in both the *Bericht* and the *Verhör.* This showed that the correction of the *Bericht* was so small, as to amount only to one-seventh

of the total false statements in the *Bericht*, while two-fifths of the false statements in the *Verhör* were corrected. This clearly shows that the confidence in the *Bericht* was so great that there was no thought of correction. (58. pp. 325-326.)

It is quite different with the *Verhör*. The activity here is passive or reactive in a sense of being constrained from without,—though it is quite necessary and helpful for recall of what the spontaneous report fails to give. The effect of a question or theme for recollection is twofold (24): it offers a key to open the store-house of the latent ideas which otherwise may remain continuously submerged, or it may draw the observer's attention to a gap in his knowledge so that he attempts to fill it with an answer of some sort. And this is done quite often from an irresistible impulse, since every question, even the most indifferent, the most cautious and the most unsuggestive, as appears in the experiments, is more than a mere question. It is a command for a recollection and the production of a certain answer (58. p. 330). This double effect of a question in suggesting to an observer a true or false answer is clearly seen in all the results mentioned. So great is the wish to give a certain answer, that the critical power is weakened. Hence the increase in quantity and the deterioration in quality in the report. The psychological conditions of the false answers are very different and depend on many factors which will be discussed later.

Obviously there are disadvantages in both the *Bericht* and the *Verhör*. Testing the mental state of a child by either would be a defective method. As Stern (58) and Wreschner (70) state, the spontaneous report allows very great latitude in individual voluntary activity and this causes some observers to notice very few, and others very many details, thus making the comparison of the different observers a particularly difficult problem. Moreover, we can not state justly whether a failure in regard to a certain fact or point in the *Bericht* is due to a lack of retention or failure in the power of immediate recall. Hence neither the *Bericht* nor the *Verhör* taken separately give the real mental status of the observer. They must go hand in hand. We must remember what we have already shown that to neglect to train the power in the *Bericht*, and to rely on the *Verhör* alone is to make children passive and halting in their self-expression and independent mental activity.

The following examples taken from the answers given by our observers show the great individual variations among pupils. Some can do good work respectively in both the

Bericht and the *Verhör,* while most of the observers fail in the *Bericht,* not only when given before but also after the *Verhör,* in spite of the fact that they can do fairly good work in the *Verhör.* One boy who could answer in the following *Verhör* twenty-three questions correctly out of twenty-four, gave his *Bericht:*

"South America is mountainous in the northern, eastern and southern part it is lowlands in the central part and hilly in the western part. (12-year-old.)"

A fifteen-year-old boy gave this *Bericht,* but answered nineteen out of twenty-four questions in the *Verhör* following.

"South America has a narrow surface center a level plain on the north and south and a mountain highland on the east and west with an irregular coastline."

On the other hand, a fifteen-year-old boy answered only eight out of seventeen questions, though he had given the following excellent *Bericht.*

"The three Guianas (British, Dutch and French) are interested in the production of cane-sugar and its by-products, molasses and rum. Owing to the decline in the price of sugar-cane, the British planters have replaced it by coffee and cocoa. The British supply one half of the fuel and coal used, and the United States one fourth. A large amount of rubber is produced in the Guianas, and an important amount of gold. Most of the cultivation is done on a narrow strip of land near the coast, where most of the people live. Paramimbo is the important trade center at Dutch Guiana, and trade of French Guiana."

A thirteen-year-old girl had answered correctly twenty out of twenty-four questions, but gave a poor *Bericht* after the *Verhör,* viz.

"South America is very mountanous, it has a higher highland on the west and a lesser highland on the east and a great plain between."

A twelve-year-old boy had answered only fourteen out of twenty-four questions, but gave a fine *Bericht* after the *Verhör,* viz.

"South America resembles North America in shape, etc. The northern part is wide but tapers towards the south. There are great mountains on the west and smaller highland on the east. The Andes highland on the west is long and narrow; and higher than the rocky mountains of North America. The highland of Brazil on the eastern part is wide but not nearly as high as the Andes. There is a great plain between these two highlands called the central part. It is divided into three sections. The central part along the Amazon river is called selvas meaning forests. The northern part is called llanos meaning grassy plains, the southern part called pampas also means grassy plains."

The Nature of the Answer Depends on the Form of the Question

There are various forms of suggestive questions, though not always perceived as such. Stern says that hardly any ideal question is an entirely unsuggestive question. (58. p. 339.) Hence it is impossible to avoid suggestion in the *Verhör*. (64.) Against the above statement of Stern, Miss Borst (9. p. 78) argues as follows: "I can not agree with him. According to my opinion, there is suggestion only when we put to an observer a question which refers itself to an object which was not present in the picture or the like employed for the experiment, and by means of which a false idea will be smuggled into the observer's mind. All other questions, however, which refer themselves to a really presented thing, build only a support for recollection, and that is exactly what is aimed at by the *Verhör*." (9. p. 78.) Thus she means by a suggestive question one which gives a false suggestion, but, as we shall see later, we know that a question may suggest a right answer. Moreover, what does her phrase "a support for recollection" mean? Does it not mean a narrowing or limitation of our conscious activity, leading or inducing the observer to focus his attention on a certain idea or ideas? When the mind of the observer becomes more and more a blank as the result of voluntary inhibition of ideas or associations, he is more apt to yield to suggestion. This is because the power of suggestion often consists in the fact that the mind is centered on only one or two ideas; all distractions are carefully excluded, and much greater power is therefore manifested along the restricted line than when the mind is attending to many stimuli simultaneously or in rapid succession. Inhibition of all ideas but one greatly intensifies the one.

Along this special train of thought we are prone to be swept by suggestion. Does there not then in the function of support for recollection lie a suggestive influence which she seems to ignore? It is a matter of course that every question is not suggestion, but there is suggestion in every question. She further says: "One observer, for instance, forgot to name an apron in his enumeration of the articles of clothing, and I put to him the question, whether the child had on an apron or not? Here we have certainly nothing to do with a suggestive question, for there is no ground at all which to the observer would suggest a positive answer rather than a negative one." (9. p. 78.) But if the observer failed to notice the apron, as Breukink (11) found, he might get a suggestion from such a question. We can not, however, agree with Stern (64) when he says that it is absurd

to ask, for instance, about the color of a hat, when the observer has not named it in his enumeration of articles of clothing. He maintains that by this question suggestion will be made; for when the observer omits the naming of the hat, it shows that he had no recollection of its existence. Miss Borst remarks, I do not understand this objection: "The investigations of memory teach us (and Stern himself has emphasized this) that it can not be said that a recollection has vanished from the memory. Even when it does not occur spontaneously; elements of recollection can remain latent in memory. The purpose of the *Verhör* is precisely to revive these elements of recollection from their latency." (9. p. 79.) All the other investigations as well as our own have shown that the observers have failed to mention certain things, yet answer questions in regard to them with certainty. It is a question whether or not such an answer is suggested or a real memory. Probably both factors co-operate in such a case. A question as a whole has not a suggestive influence when the memory is clear, vivid and strong, and accompanied by a feeling of certainty. On the contrary, every question is apt to be suggestive when the memory is vague, obscure and uncertain.

The suggestiveness of the questions may be graded artificially according to the logically-grammatical form of the questions.

Attention was drawn to this problem first by Binet (6. pp. 297 ff), but the more elaborate gradation was left to Stern (58. pp. 338-345) and later taken up by Lipmann. Stern grades the suggestiveness of the questions beginning with the least suggestive as follows: (1) The determining question (*Bestimmungsfrage*), or the question introduced with interrogative-pronoun or adverb: which, who, where, why, etc; (2) the complete disjunctive question or the "yes or no" question; (3) the incomplete disjunctive question or the "either-or" question; (4) the expectant (leading) question or the "yes" question or "no" question; (5) the hypothetical and (6) the sequential question (*Folgefrage*). Lipmann (33. pp. 58-60) used practically the same distinctions. Each of these forms of the questions has its own peculiar psychological significance or function. We shall follow the analysis of Stern.

The determining question offers a wide field of ideas within which an observer can exercise his own power of free choice. Hence he can be self-assertive in his answer; for instance: what is A? Describe B? has no limitation for the field of ideation about A or B. Such a question simply appeals to the

memory without suggestion. Thus it is considered as the most indifferent and harmless question.

The complete disjunctive question, or the "yes or no" question, requires the observer to decide between the two ideas offered by the question, or between 'yes' and 'no,' one of which is always false. For example: Was that A or not? Here the idea A is presented to be selected or negated from the vast field of other ideas, and apparently there is no limitation for the answer. But when we introspect, we perceive the idea A clearly and distinctly with vague ideas coming and going in our conscious field, as its back-ground. Consequently the idea A has an affirmative, while the rest have a negative tone. The only chance is either to affirm or negate A. This limitation in the selection of the answer renders the suggestion more influential than the preceding question.

According to both Stern and Lipmann, the tendency to answer "yes" is stronger than that to answer "no," but Borst takes an opposite view. This may be due either to the special influence of her oral questioning or to difference of suggestibility of the observers, as it is found by Goddard (23. p. 4) that a certain type of child will always answer the last of two alternatives. Our experiment also shows that a certain child answers always with "yes," and another always with "no," no matter whether the question is a "yes or no" question or expectant question, but the tendency to answer "yes" is far stronger.

Lipmann says (33. p. 58) that the complete disjunctive question, for instance: It is A or B? is less suggestive than the "yes or no" question, *e. g.,* Is it A? This is to be contrary to the result of writer's own introspection. The form, "Is it A or B?" suggests dual or rival determination, presupposing belief in a sphere of existence in which either supposition or both may have confirmation according to the meaning. Though there is surely suspense as to which of the possible assertions is to be accepted, but the certainty of the issue to be A or B or both is expressed, and consequently the field of ideation is exhausted by A and B (15. p. 347). On the other hand, "yes or no" question, *e. g.,* "Is it A or not?" or "Is it A?" are of an indefinite alternative over against the definite alternation of the complete disjunctive question, because "it may be A," or it may be something else. Of course it may happen to be exclusive, if "it is A," but never exhaustive in its suggestive influence like the complete disjunctive question proper.

There are two kinds of "yes or no" question which are ignored by the great majority of questioners. A question,

"Is it A?" is called a true "yes or no" question, when the answer A is true; and it is called a false "yes or no" question, if the answer A is false. The following table shows the difference of suggestiveness of each form of question for 117 pupils in our experiments.

	r	f	u	$\frac{r}{r+f}$	$\frac{f}{r+f}$
True yes-no-q.....	174	25	11	87.4	12.6
False yes-no-q.....,	119	85	8	58.3	41.7

Hence it appears that the true "yes or no" question produces far more right answers in every case than the false one, while the latter without exception produces more false answers than the former. Moreover seven of 117 pupils answered with "yes, so and so," and three with "no, so and so" to every "yes or no" question whether or not its content was true or false. From these results it appears that our school children are not only suggestible but also are mechanized to react to the form of the question instead of to its content.

The expectant question (leading question), is more suggestive than the former according to Stern and Lipmann, since the form of the question in itself represents the questioner's expectation and leads the observer to accept it unconsciously. Take, for example, a question: "Was it not A?" and analyze it into the two parts: "It was A" and "was it not?" The first part affirms that it was A, while the second shows a clearly expressed expectation. The mind has a tendency to accept as true anything that enters it. A belief is urged from the start by the words "was not." The suggested idea must, thus, dominate, even when the observer has a clear knowledge of it, as the possibility of doubt is covered by the probability of the expectation. The first given interpretation persists and is taken as true even without being consciously regarded as true or false. This is frequently true when his knowledge is vague, and his belief in the questioner is strong. The expectant question is, according to Lipmann and also in the opinion of the writer, weaker than the incomplete disjunctive question, for the former causes the observer to appeal to his memory, feeling of course the influence of the insinuation which results from the question, and in some cases the word 'not' serves as a warning, while it is not the same with the incomplete disjunctive question which offers two ideas, neither of which is true, presupposing that one of them is true.

Lipmann differentiates the expectant question as false and true according to its meaning. For example: Is it not A? is true if asked, when the answer A is right, and it is false, when the answer A is false. His result shows (33. pp. 69-70): "the false answers were diminished about 24% by the right expectant questions, and the right answers were diminished about 18% by the false expectant question in relation to the total statements. The right answers were increased about 12% by the true expectant question and the false answers about 2% by the false one, in relation to the total statements. In both cases the suggestive formulation caused an increase of the uncertain answers; with the true expectant question about 13%, and with the false about 17%. Thus he concludes that the true expectant question has a stronger influence than the false, and that the former brings out more right and fewer false answers than the latter. (33. pp. 54, 60, 61.)

Our experiments with 117 pupils confirm Lipmann's results. The expectant questions gave: r = 137, f = 27, u = 1, that is, the true statements amounted to 83.7% and the false ones to 16.3%, while with the false expectant questions, r = 98, f = 55, u = 8, that is, 64% and 36% for r and f respectively.

Furthermore twelve of 117 pupils in both experiments answered every expectant question, whether true or false, with "yes, it is so," and three with "no, so and so." Here again, the children are habituated to react to the form of questions, and not to their content. It is of a vital significance for a teacher to recognize this different function of the true and false questions, as each gives such a different result clearly shown by our table.

The incomplete disjunctive question is stronger in its suggestive influence than the preceding ones, since here neither of the answers can be right. As, in case of the complete disjunctive question, the possibility of an answer is not only logically exhausted, but the probability of a wrong answer is very great; for to answer independently of the two alternatives offered requires a mental self-reliance, of which most of us are not capable. This type of the question too can be divided into two forms: true and false, according to its content.

The hypothetical question is in its form exactly the same as that of the determining question, for instance: "what is the color of A?," and must be valuated unsuggestive from the stand-point of the form. But suppose that the observer until questioned did not know of the existence of A, what will be suggested? He will surely reason: The question asks now after the color of A, then there must have been A (58.

pp. 342-343). He will thus come to silently accept the intentional suggestion of the questioner. If A is once accepted, it is easy to attach attributes to it. Even when the observer does not or can not attach a color to A, if, for instance, he answers, "I do not know its color," he is still a victim of the suggestion, for he tacitly admits the existence of A in the form of his reply. The hypothetical question also can be divided into true and false forms according to its content. (33. p. 59.)

The sequential question makes use of an implication: One who says A, must also say B. (58. p. 343.) For instance: If a question, "was not A there?" (when in reality it was not there) is accepted by the observer, then this acceptance means that he will admit the existence of the color, size, etc., of the A, as it is natural to infer that the A should have been colored, etc. The sequential question is used when a hypothetical or the like question is accepted.

Thus we can make a graded series according to the degree of suggestiveness contained in the form and to some extent the content of the questions. However, the suggestive influence of each form of the above questions is not in its numerical percentage proportional to the scale. To answer a hypothetical and sequential question, a part or the whole of an object or a thing must be invented, and this invention needs a great mental effort, or a struggle against the present mental state. This is probably the reason why these questions result often in a small percentage of errors. Again that the effectiveness of the suggestive questions declines strongly with increasing age, while the frequency of the erroneous answers to the normal questions is fairly independent of age, shows that the nearer a question is to the normal, the less suggestive it is.

It is interesting to note that the observer passes through various stages of mental resistance against the suggestive influence of questions. According to Binet's observation, the first instance which follows the reading of the question is a moment of scepticism. This is shown by a murmur, "But I don't know," or by the gestures of ennui or negation, or mimic expressions, etc. Some translate this state of scepticism by the written answer, "no," which they finally efface; some say "no, it was not so." This state of an initial resistance persists indefinitely with some observers. (6. p. 303.) The second phase is that of half yielding to the suggestion. The observer commences to write his answer, but he is arrested by a decisive word or words. Finally, a third phase is that of the execution of the suggestion. Here the observer shows often,

at the moment when he writes his answer, a flushing of the face, as if he had a sentiment of shame. On the other hand, there is sometimes a resistance which is first at a maximum and then terminates with a disbelief in suggestion. (6. p. 304.)

The same phenomena have been observed very distinctly by the writer in his own experiments. It is rather surprising to find that thirty-two cases of 117 pupils in both experiments erased their answers to the "yes or no" questions as well as to the expectant questions and corrected rightly or wrongly in the following ratio, that is, twenty-two cases rightly, and ten wrongly.

For example, some pupils answered, "Yes, it is as irregular as that of North America" to the question 3 (b) (Is the coast of South America as irregular as that of North America?), but erased this answer and wrote "No, it is not." Others wrote first, "Yes, it means level land," to the question 21 (b) (Does 'llanos' mean level land?), but corrected it to "no, it means highland," erasing the first answer. Besides these thirty-two cases of correction, there were four special cases where two pupils wrote "no" as an answer, but erased it, and then wrote "no" again, while the two others did the same with "yes."

A comparison of the suggestive influence of each form of the questions by means of the experimental results already obtained follows.

That the "yes or no" question is more suggestive than the determining question has been shown experimentally by Binet (6. p. 313), Chomjakov (14), Lipmann (33) and others. Our investigation with 13 pupils showed with the normal questions (3, 9, 16, 19, and 24 of 2nd series, appendix), true answers amounted to 71.9%; false ones to 21.9%, and uncertain ones to 6.2%; with the corresponding true "yes or no" questions with 42 pupils, 90.4%, 9.6% and zero % respectively; and with the corresponding false "yes or no" questions, 54.7%, 41.5%, and 3.8% respectively.

The results of Stern, Rodenwaldt, Oppenheim, and others show that the leading (expectant) is more suggestive than the determining question. But in all these cases, the leading as well as the normal questions were applied to the different objects, so that we may not be justified in depending upon their results. The results of Chomjakov and Lipmann can justly be relied upon, for they applied both kind of questions to the same objects, though as a matter of course using them on the different observers. Chomjakov (14) showed three groups of each fifty students a sheet of paper which was

spotted with red and violet color. The first group was asked: "How many red and how many violet spots have you noticed?" The second was asked: "Have you not noticed red spots between the numerous violet ones here and there, and how many were there?" The third: "Have you not noticed between the numerous red spots here and there, also violet spots, and how many?" The results were: The first group answered on an average with eleven red and eight violet; the second with fifteen violet and four red; the third with four violet and fifteen red.

Our results agree to some extent with Lipmann's (33. pp. 53-4, 68-9). They show clearly that the true leading questions suggest the right answers more strongly than the false leading questions do the false answers when compared with the nonsuggestive questions corresponding to both.

We obtained in the experiments with the normal questions (8.13 and 21 of 2nd series, appendix) with 13 pupils: true answers = 71.8%, false = 20.5%, and uncertain = 7.7%; with the corresponding true expectant questions on the 42 pupils, r = 94%, f = 6%, and zero for u; with the corresponding false expectant questions, 66.7%, 20% and 13.3% respectively.

From all these experimental results, it is seen that the expectation aroused by means of the phrase, "Was it not," or words like "numerous," "truly," "perhaps," "honestly," etc., or some special instruction or silent manipulation—as in the experiments of Lobsien (38), Kosog (29, 30), Seashore (56. pp. 30-31), Scott (55), Plecher (47), and others,—produces a high percentage of suggestibility. And that the false leading questions do not act more suggestively than the false "yes-or-no" questions, provided that the former are differentiated from the latter only by the word "not," is determined by both Lipmann (33. p. 70) and Rodenwaldt (50). In our own experiments the false "yes-or-no" questions brought out more false answers than the false leading ones. This is perhaps due to the fact, as Rodenwaldt rightly states, that "the intelligent observers easily discover that they will be led into a trap by the word 'not'" and become cautious, while they more easily fall into a trap with the false "yes-or-no" questions where the word 'not' is omitted.

For the suggestive influence of the false hypothetical and the incomplete disjunctive questions the readers are referred to Lipmann's exact work (33. pp. 75 ff), Binet (6), Lobsien (38), and others.

In summarising, it may be said that the suggestiveness of a question to a great extent depends upon its form and its

content; that a determining question is the least suggestive; that the true leading as well as the true "yes-or-no" questions are more suggestive than the false ones, the former evoking more right answers and the latter more false ones without exception.

Relation Between the Suggestiveness of a Question and a Questioner

It makes a great difference whether a question is presented to a pupil by his fellow-student or by a teacher; to a witness, by a disinterested person or by a judge. "The presence of persons," says McDougall (40. pp. 98 ff), "whom we regard as our inferiors in the particular situation of the moment evokes the impulse of self-assertion; towards such persons we are but little or not at all suggestible. But, in the presence of persons who make upon us an impression of power or of superiority of any kind, the impulse of submission is brought into play, and we are thrown into a submissive, receptive attitude towards them." "The personality or impressive character," says Keatinge (26. ch. 5), "can set up in another a state of emotion sufficient to produce an unstable and easily dissociated condition of mind, and thus to inhibit the rise of the development of contrariant systems." Such an authoritative influence is apt to modify the nature of an answer.

Thus under the influence of an authority or of masterfulness in the questioner, an observer may come to such a logical conclusion as follows: "Why, what else can I think of? The desired answer must surely be right! The questioner should know it; why, I thought it was this, but he asks about that, am I then mistaken, or is he? No, he should not be so, then I must be." Consequently, if a question is a "yes-question" or a "no-question," he will answer "yes" or "no" without further reflection. If a question is a "yes or no" question, he will react to it with "yes," irrespective of the content of the question, even where according to his knowledge, the answer should be negative. Some pupils, as we have seen, are mechanized to answer "no" to every "yes or no" question, whether its content is true or false, while the majority are habituated to "yes." If, however, a question is an incomplete disjunctive or a false hypothetical question, one will decide in favor of the most probable answer (33. p. 214).

Next to authority, the facial expression of a questioner has a great influence not only for provoking or inhibiting an

answer, but also for determining its nature. The following examples are illustrative (68. pp. 84-85):

Counsel (taking up the two lower bones of the leg attached and approaching the witness.) "Will you please take these, doctor, and tell the jury whether in life they constituted the bones of a woman's leg or a man's leg?"
Doctor. "It is difficult to tell, sir."
Counsel. "What, can't you tell the skeleton of a woman's leg from a man's, doctor?"
Doctor. "Oh, yes, I should say it was a woman's leg."
Counsel (smiling and looking pleased). "So in your opinion, doctor, this was a woman's leg?" (It was a woman's leg.)
Doctor (observing counsel's face and thinking he had made a mistake). "Oh, I beg your pardon, it is a man's leg, of course. I had not examined it carefully.'
Counsel (still smiling). "Would you be good enough to tell the jury if it is the right leg or the left leg?"
Doctor (quietly and hesitatingly). "This is the right leg."
Counsel (astonished). "*What* do you say, doctor?"
Doctor (much confused). "Pardon me, it is the *left* leg."

Here it is clear that this doctor's answer was modified wrongly by the counsel's facial expression, which was interpreted by him as a sign that his answer was wrong. So, too, children's answers in the school-room are often modified by their teacher's facial expression. We cite a few examples from the returns to a questionnaire used not for the purpose of studying questioning but for the study of imitation and suggestion.

"The teacher in history may ask you a question and generally one that has to be explained. It might take three or four minutes to answer. All the time her face seems to be a perfect blank. She does not look at the person reciting or answering but directs her gaze in another direction. Sometimes I stop and wonder if I am saying the correct thing and then finish the recitation or answer in its midst. If she would only attend to our answers and recitation, we would have much more confidence in our work and do it better."

The slightest inclination of the head, the dropping of the eyelids, or a certain expression of the face are apt to be read by the shrewd pupil as a sign of the truth or error of his answer, so that he may continue or stop his recitation. (4. pp. 76-77.) It is better not to give any sign whatever while a pupil is answering, except for an encouragement when a pupil is timid or hesitates to express himself.

To help a child by such signs makes him passive, leads him to depend upon the teacher instead of relying upon his own knowledge. It fosters guessing or leads a bright but unprepared pupil to steer through a recitation guided by the

unsuspecting teacher. This will be more clearly understood through the following examples:

"I know," says a Normal School girl, "some teachers who ask a question in such a manner and tone that it is easy to know whether the correct answer is 'yes' or 'no.' Then I have known of another case where by the teacher's facial expressions, gestures, etc., you could tell, if you had only recited the first part of the answer, that it was wrong or right." (Twenty-one cases.)

Another girl says: "I have always been greatly aided in my recitations by carefully watching a teacher's face. In most instances I can tell whether or not I am 'on the right track.' There is something about their facial expression (very slight indeed) that helps me to 'feel my way,' so to speak. This means, of course, was used more during my grammar and high school years."

As the facial expression, so the tone of a teacher's voice affects the answers of children. In our school rooms we frequently notice that the pupils often decline or fail to answer the questions asked, and generally it is inferred that they do not know. But such an interpretation is very often incorrect. For instance, a girl of twelve says: "I knew very well the answer, but the teacher's tone of questioning suggested to me that she does not care much about the answer. So I felt that my answer was not important and consequently I did not answer." (9 cases.)

Two girls of the seventh grade say: "If a teacher shows that it is fun for her to ask a question, we become stubborn and simply refuse to answer."

Still another girl says: "If her tone indicates that she is cross, I don't feel free to talk during her lesson or to answer her questions; it also discourages me and makes me not to enjoy the subject. As a result I often remain silent waiting impatiently for the period to end."

"Our teacher's voice was so sharp and cross that whenever she called my name, I became very nervous and could not answer her questions even when I knew them well." (Thirty-one cases.)

On the other hand, a teacher who teaches out of the fulness of her heart will stimulate more responses in the children's minds and hearts.

Again when a questioner puts a special emphasis on a certain word or uses either rising or falling inflection in her questioning, the corresponding answer may be of little value. An observer takes a suggestion from the word that seemed most emphasized and reacts to it with the very word. Such a reaction is most likely to take place when a "yes or no" question or a "leading question" is asked with a certain inflection of tone.

Closely related to the above factors is a questioner's expectant attitude towards an observer. "As well known," says Krebs, "if everybody, especially those to whom we look

up expect us to fail, it requires the puissance of a psychological giant to withstand this killing psychic atmosphere. . . . If, however, they expect us to do our best, that very cooperative expectation inspires and infires us to do it, and we succeed." (31. pp. 53-54.) So, too, the expectation of a teacher causes the weak-minded, the discouraged, the nervous, and the like to form the same opinion of themselves. Thought tends to realize itself in actuality; they become what they think. This is why some children are made nervous or confused and often fail to answer a question or to recite, when asked with words like these: "John, can you answer, I don't think you can, but try it; Mary, I doubt if you can. . . . and so on."

A seventeen-year-old girl reports: "In another class I am almost afraid to say anything, because the teacher impresses me as having the attitude that she is sure I am going to make a mistake, and that she is very much surprised if my statement is correct. In one or two instances, I have known this teacher to stop a pupil in the midst of a statement, saying that it was wrong; while if she had let the pupil finish it would have been correct." (Five cases.)

Another factor that has an important effect on the nature and the possibility of an answer is a sympathetic or nonsympathetic attitude. Sympathy is an indispensable quality for normal suggestibility. As in water, face answereth face, so in man, the heart to heart. The following examples are illustrative:

"The plaintiff, a laboring man, had been thrown to the street pavement from the platform of a car . . ., and had dislocated his shoulder. He had testified . . . that . . . he had not been able to follow his usual employment for the reason that he could not raise his arm above a point parallel with his shoulder. Upon cross-examination the attorney for the railroad asked the witness a few sympathetic questions about his sufferings, and upon getting on a friendly basis with him asked him 'to be good enough to show the jury the extreme limit to which he could raise his arm since the accident.' The plaintiff slowly and with considerable difficulty raised his arm to the parallel of his shoulder. 'Now, using the same arm, show the jury how high you could get it up before the accident,' quietly continued the attorney; whereupon the witness extended his arm to its full height above his head, amid peals of laughter from the court and jury." (68. pp. 47-48.)

Such a drama is played by our school children more or less in response to a teacher's sympathy towards them. The effect of any unsympathetic attitude appears in various ways as follows:

A girl says: "One teacher I had was never sympathetic toward me. She was always finding fault with my recitation and answer unless I recited the lesson in her words. Thus I failed to answer even the easiest question." (Eight cases.)

Another girl says: "A fault-finding attitude of our teacher amuses me so much that I look indifferent and hit less in my answering in order to excite her." (Three cases.)

Relation Between Questions and the Person Questioned

All experimental results show that a suggestive question succeeds in one case, but fails in another. It never succeeds uniformly. Again some persons are so suggestible that they are influenced, even by nonsuggestive questions (57. p. 132); others can resist even the strongest suggestion involved in a question. The suggestiveness of a question thus depends primarily upon the suggestibility of the person questioned, and this is not constant, being dependent on many internal as well as external factors.

First of all, the mental content of the person questioned is responsible for the suggestiveness of a question. The potential starting point of an individual reaction is an object or a fact, ideal or perceptual; and every object, or idea, possesses for an individual mind a stimulative or a suggestive influence. The individual conscious state at the moment interprets a stimulus, accepting or rejecting it. Hence, if the content of the mind in question is poor, ill organized and unsystematized, the mind is apt to be a victim of an external as well as an internal stimulus. This is the reason why many experimenters hold that the less intelligent an observer is, the more suggestible he is, and that children are, in general, more suggestible than adults. Even with people of higher intelligence, deficiency of knowledge relating to the given topic heightens the suggestibility of the person questioned.

In the case of a child, a similar suggestibility occurs whenever there is little or no direct conflict with his experience. A child believes in any commanding idea, in a pleasurable or wished-for thing as well as a dreadful or not-wished-for thing. This subjectively conditioned belief, auto-suggestion or credulity supposes always a grade of dissociation, from which no child can be absolutely free. If this dissociation increases, the object of each agreeable idea can be finally believed and appears as real. (37. p. 246.) Belief is an original and a natural process in the mind of a child. He does not doubt any thing that he learns until he has accummulated a considerable amount of knowledge, and attained a relatively high stage in the development of intelligence. Moreover "to doubt is usually unpleasant and may arouse complicated strain sensations to add a new element to the unpleasantness" (46. p. 34).

Consequently, even when a child's knowledge is comparatively accurate, when he is under the sway of an authoritative impression or his own auto-suggestion, he may answer as suggested, thinking that perhaps that is called 'A,' which

used to be called ' B.' Such a reaction may not take place so easily if a question is asked by a fellow-student or an inferior person, but it is apt to happen under the influence of authority. When a person is influenced by a suggestion he loses his critical or analytical power towards the form and content of a question and simply attends to or searches in his memory for corresponding ideas, and finally produces his answer as if it was a spontaneous report. Whenever credulity and authority go together, the result is doubtful. Lack of will, too great credulity, and too little self-criticism are great obstacles to independent, self-assertive reaction (62. p. 272).

Another group of persons yield to a suggestion even against their own knowledge, because of their affection or because ambition is aroused towards a questioner. An observer really knows that to answer ' A ' or not to answer at all is contradictory to his own knowledge, but he does not venture to resist the question asked; for he does not like to make himself disliked, or he fears punishment or some kind of annoyance. (33. p. 216.) Thus under certain circumstances, some observers conclude not to contradict directly, but also not to come in conflict with their own knowledge, and hence take an attitude of a compromise. (33. p. 231.) These affective reactions perhaps decrease with growing mental development and education. If this affection becomes stronger the suggestibility of an observer in general increases. " Whatever weakens the reason," says Cooley, " and thus destroys the breadth and symmetry of consciousness, produces some form of suggestibility. . . ." (18. p. 40.) So, too, Bleuler says that the suggestibility grows proportionately with the strength of an existent affection (7. p. 54), so that we find memory illusions even in the normal individual as soon as affection comes into play (7. p. 69). He continues: " Both suggestibility and affection render criticism difficult or check it even completely." (7. p. 69.) If an observer comes under such an influence, he becomes the unresisting instrument of a questioner. (58. p. 333.) He gives an answer to a question, but does not examine whether it is right or not; he simply contents himself with a vague feeling that it may be correct; he estimates the authority of the examiner higher than that of his memory.

Similarly the ambition of an observer changes the quality and quantity of an answer to some extent. Franken (22. pp. 214 ff), Kosog (29. pp. 71-72) and others have shown that the ambition of an observer increases with the range of his knowledge, increasing the extent of an answer but reducing its qualitative value. The reason seems to be that with

ambition the power of caution or criticism is checked and the childish imagination is intensified (29. pp. 71-72).

Closely connected with this group of reactions is a type of reaction traceable to the so-called counter or contrary suggestibility. This is a tendency to react, immediately, uncritically or critically, but always negatively, to the suggestion made. (39. pp. 372-374.) If such observers notice that a definite answer is suggested by a question, then they form the opinion that this answer will probably be false.

There is an acute type of this contrary-suggestibility which may be termed an inborn contrary-suggestibility. Here the mode of reaction approaches almost the negativism described by Kraepelin as "the instinctive resistance against every outer influence upon the will" (8. p. 10). As soon as such an one gets suggestion, he feels antagonistic; no idea suggested gives him any satisfaction and so he chooses something else, and the "something else" is apt to be the opposite, since "each idea suggests, as it were, a contrary idea as its natural complement" (8. p. 32).

However this tendency in children is not rebellion or conscious assertion of the self against an opposing will. "It represents rather that stage in the normal process of self-development in which the crude materials of rational action have been given, but in which successful co-ordination has not yet become possible" (39. p. 379). "But to have become the characteristic form of reaction in an adult is an indication of arrested development, since in proportion as this type of action predominates, the mind becomes blinded to the very basis of rational conduct. It must be utilized . . . . . to establish that habit of reflecting upon reasons for and against any suggested course of conduct" (39. p. 380).

Besides those above mentioned, there are still at least two types of reaction due to exercise or repetition. A question draws the attention of the observer to a given problem and gives rise to an idea of purpose (*Aufgabe*) to solve it. This idea of purpose conditions a certain mental state which may be called "Attitude or a definite reaction mood" (*Einstellung*) (33. p. 77). This attitude or mood, after several repetitions of reactions to the same stimulus in a definite way, is apt to develop into the purely mechanical or expectant mode of reaction.

The purely mechanical reaction or habit is found to play a great rôle in the well known abnormal or supernormal suggestibility of soldiers (50. p. 315), policemen, children and others, under strict discipline. Here the suggestibility is undoubtedly fostered by exercise. So, too, some observers

are found very often to acquire the habit of either a motor or vocal reaction, to a similar stimulus. If children are habituated to react with an answer "yes" to a "yes or no" question, they will be mechanized to this mood of reaction, and will answer without reflection but merely automatically, even when the content of a question is entirely changed from true to false.

To discover how an expectant attitude affects even normal questions, Lipmann (33. pp. 78-81) made another experiment which showed that the increase of error is greater in an experiment with a leading question as the first of a list of questions than in a series without such a question, which produces an expectant attitude towards the rest. Again an expectant attitude may affect suggestive questions in a peculiar way. For instance, after an observer has answered a number of normal questions in succession, he is apt to fall into the trap of a suitably formulated suggestive question, or questions where their suggestive character is not apparent (33. p. 77). In all these experiments it is hard to say how much of the results is to be ascribed to suggestive questions, and how much to an expectant attitude, but we may safely say that the expectant attitude has played an important rôle, since its function is to dull the critical power, which Rodenwaldt (50. p. 316) found stands in inverse ratio to suggestibility. There are cases, however, as in Seashore's experiments, where even the greatest caution will not ensure protection against skillful suggestion (56. p. 43).

Children's suggestibility may be due also to their lack of attention, defective observation, lack of language, etc., or all these factors combined. It is thus difficult to say that a particular result is caused by a definite influence. It is a teacher's function to investigate the suggestibility of each pupil and to make practical use of such knowledge.

Questions From the Pedagogical Point of View

Questions, as employed by teachers, may be divided according to their purpose.

1. The preliminary or experimental question aims to find out what the pupil knows. The teacher, by means of this class of questions, is able to arouse a pupil's curiosity and intellectual activity (21. pp. 76, 81).

2. The questions employed in actual instruction, by means of which the reasoning power of a learner is exercised are analytical or developmental. The purpose of the analytical question is to analyze knowledge into its elements in order to bring its implications to consciousness (19. pp. 180), while

the developmental question is to aid the pupil in arriving at a clear comprehension of classes, rules, principles, etc. It is especially applicable in the inductive approach to general truths, but equally serviceable in making verification of principles assumed (19. p. 181). These two types of question are generally employed in scientific studies or those which exercise reasoning power. Their aim is both to impart knowledge and to train purposive thinking.

3. The questions, through which a teacher tests her own work after a lesson has been given and ascertains whether it has been thoroughly understood, may be called disciplinary or 'examination questions.'

4. Very closely connected with questions for examination are those for review. Here the aim is to impress the facts taught upon children's minds.

5. Another type of question aims exclusively at drill, the establishment of a sort of mechanical association, as employed, for instance, in language studies. Here the attainment of a prompt reply is the sole aim. This type of question is unfortunately abused in our school recitations and often applied to subject-matter for which it is unsuited.

The most fundamental function of questions in most cases is didactic, that is, to stimulate thought in the direction of the solution of a problem, instead of mere verbal memory exercise, drill or habit-formation. It is to lead pupils to recall objects previously known, to bring to consciousness former experiences to give a new meaning. But unfortunately the belief in a "faculty of memory" has led popular educationists to an exaggerated estimate of the value of questions for verbal memory training. Certainly memory is a basal factor for all sorts of learning, as Miss Calkins says, "not only creative imagination but all forms of thought are based on memory." We are, however, skeptical of that sort of teaching which merely aims to equip children with a mass of fragmentary dissociated knowledge in order that they may later in life find a use for it. The teaching of children's memories must be based on rational understanding so that they may be able to control or direct their ideas toward some end, toward the solution of some problem.

According to Stevens' investigation (65. p. 47), an average number of questions during a History lesson of one period is ninety-three, for English, eighty-five; of the former 76.6%, and of the latter 49%, are based directly upon the repetition of the text-book. For example: When was the battle of Waterloo fought? When was Scott born? What kings of England led crusades? Now what do such questions suggest

to children? Will they not become merely an incentive to memorize by rote the words of the book, rather than to work out the problem and get ideas of their own? They do not stimulate reflection as do such questions as, for instance: Why do you like the Lady of the Lake better than Marmion? Why is it that Minneapolis could develop so quickly? Compare the quality of A with that of B. By pure memory questions pupils become apparently but not really self-active. Thus Scherer even went so far as to say that the apparently greatest perfection in the art of questioning has as its result the greatest dependency of the pupils (54. p. 27).

Over twenty-five per cent of the more than 300 returns to our questionnaire as to what school subjects were liked or disliked state that the writers liked English literature and History best, if the teachers did not bother them by silly questions on trifling facts and waste time without going into any interpretation or evaluation of the literature itself. This is clearly brought out in the following excerpt:

"I have had experiences in English literature where we were driven to stand and tell from memory the names of authors, when they were born, where they were born, how long they lived, what books they wrote, when they died, where they died, where they were buried, and so on along the same line. I myself at least was bored to death. I wonder what such study of literature can amount to? Absolutely nothing to me, yes worse than nothing, as I changed my purpose."

The burden that such a study inflicts upon pupils creates a hatred of literature often never overcome. The problem naturally arises, what questions then shall be used? The answer is: analytical and developmental questions, whether the method used be Socratic, inductive or deductive, topical or dialectic.

Dr. Dewey says that "a demand for the solution of a perplexity is the steadying and guiding factor in the entire process of reflection" (20. p. 11). It becomes thus a function of questions to present this demand for the solution of a definite problem as a first step. A general appeal, however, to a child to think, irrespective of his own experience or knowledge is futile. Experience is the anchor of both wisdom and sanity (13. p. 64). Given a problem, the next step is to stimulate thought by a series of interrogations leading each pupil to correct reasoning. This method may, in a certain sense, be called Socratic, but not in the sense which Socrates himself used it. Care should be taken in the use of the so-called Socratic method; for it is primarily intended for adults who have much experience, and moreover it is, in its nature, altogether too destructive. It discourages the child by break-

ing down his misconceptions, by revealing his ignorance or his absurdity, while it offers him little or nothing of constructive material. Consequently it is likely to force the mind to think along a negative rather than a positive line or to lead to indifference. We may, however, make use of it by rendering it simpler and more constructive (28. p. 376). The teacher stimulates and directs, but never suggests a conclusion or an answer. Pupils are encouraged to present their own thoughts. If correct, the teacher deepens and widens their views by suggestive illustrations. If incorrect, their absurdity is shown by leading them to discover legitimate consequences. Thus the learner at every step feels the joy of discovery and victory instead of discouragement. In all this the teacher is only the stimulator of the pupil's thinking. The secret is: "never suggest anything which you can lead a pupil to find out and tell you." Given a problem, suggestions in the mind of the child follow the laws of association. The greater the fluidity of ideas, and the greater the number of the suggestions that arise, the more likely is the true solution to be obtained; but all these may fail; then only may a questioner suggest the conclusion.

If any suggestion of an answer is given from without and accepted at once, there will be no critical thinking, simply a minimum of reflection. If this kind of interrogation continues for months and years, the child will become a puppet and passive in his thinking, instead of active, self-assertive, and independent of external suggestion.

Another pernicious practice is that of helping or directing pupils too much in their recitations by questions or otherwise. They are never left alone to direct their own steps, and are never afforded any opportunity of self-direction to develop sufficiently the power of initiative. Should it then be a matter of surprise that when left to themselves to think and to decide or solve a problem, they dawdle and get nowhere?

Another method of developing the power of purposive thinking in a pupil is by means of dialectic or discussion. In this method, the pupils present their arguments briefly and pointedly in favor of their respective positions. All criticisms are answered and contested. The reasons for and against are carefully weighed. In these mental conflicts, the utmost power of the pupil is called forth. It not only cultivates mental power, but also self-assertion, independence, courtesy and liberality toward an opponent, and the virtue of fair play. It supplements the so-called Socratic method, by making the pupils think. Of course this method is not applicable to young pupils, but to a certain extent and in somewhat modified form

it can surely be utilized for pupils of the later grades and the high schools.

Here it may be instructive to cite an experiment by C. H. King (27. pp. 158-9) on the reasoning powers of children. He gave the following two questions to children of from twelve to fifteen years of age. "The first question runs: There are several clever boys in this class and they are all careless, so a clever boy must be careless. Do you agree with this? The second question is: French people are excitable, so are Italians; so all foreigners are excitable. Is this true? The first question was solved correctly by 144 (44.4%) of all the children who answered, and the second by 172 (56.8%). He concludes that a considerable portion of those who have received a good education and have reached the age of fifteen years fail to show anything but the germs of logical thinking."

Why is this? Why should pupils fail in such simple reasoning? Are these problems beyond their powers? Certainly not.

The habit of reflecting upon the reasons for and against any problem should be promoted by a kind of dialectic method. By a series of suitable questions the pupils are led not only to pause before they react, but also to review or analyze the complex system of factors involved in the case, so that their reaction is made deliberate and rational; otherwise they become mere empirical thinkers, of whom, James says: "Whereas the merely empirical thinker stares at a fact in its entirety and remains helpless or gets 'stuck' if it suggests no concomitant or similar, the (analytic) reasoner breaks it up and notices some one of its separate attributes. This attribute has properties or consequences which the fact until then was not known to have, but which, now that it is noticed to contain the attribute, it must have." MacDougall says: "The ideal type of human action, which all conscious education seeks to develop, is that in which each novel situation is critically reviewed as it arises before it is responded to by an adaptive reaction (instinctive reaction)" (39. p. 381).

Questions may also be utilized to disclose the intellectual or emotional bias of an individual so that reactions or answers may be given without prejudice (34. p. 28). According to Freud, "our mental processes are more rigorously determined than is commonly believed, and many of them generally thought to be causeless have in fact a very precise and definable cause. The same remark applies to many mental processes where we believe that we have a perfectly free choice. Most important, however, is the extension of these principles to the sphere of human judgment, for it is probable that repressed complexes

play as prominent a part in distortion of our ideas. On a large scale this is shown in two ways, in the minimum of evidence often necessary to secure the acceptance of an idea that is in harmony with existing mental constellations, or to reject one that is incompatible with these. In both cases it is often the affective influence rather than the intellectual operations that decides the question. The same evidence is construed quite differently when viewed in the light of one affective constellation than when viewed in the light of another" (25. pp. 478, 524).

Wrong ideas and inappropriate propositions enter consciousness through many doors and should be corrected by the influence of opposite ideas which a faithful memory and a sound reasoning provide (43). But if pupils are not trained to look into things, to reflect for and against a given problem, and to judge it fairly, they will be at the mercy of their instinctive reactions and feelings.

The Qualities of Good Questions

It is of prime importance for a teacher to provide a certain mental background necessary for the lesson and harmonize it with her own so that both pupil and teacher may have a closely similar apperception, though not composed of the same elements (2. p. 95). Otherwise a problem under consideration may be looked at from wholly different points of view and there may be a mutual failure in understanding. This is the reason why the teacher so often fails to get correct answers from her pupils. For instance: "Where was St. Paul converted?" asks the teacher, speaking from a geographical point of view; but the pupil responds, "In the ninth chapter of the Acts," from a background of textual reference (2. pp. 95-96). Hence the necessity of bringing the teacher's own mental background into harmony with that of her pupils in order that the questions may be comprehended and answered correctly.

Moreover a question should be clear, concise and logical. The first requisite is its clear comprehension. If the question lacks clearness or is ambiguous, it occasions hesitancy and confusion, so that some children may decline to answer, even when they know the answer well. "An Ohio school teacher asked of her class one day a question, but did not draw the prompt response she expected. With some surprise she turned to one of the boys, saying, 'You know what I want you to say, Johnnie; why don't you say it?' Johnnie replied, 'I know what you want all right, but you ain't asked the question what fetches it." Here the youth, wiser than the

teacher, refused to yield up his store of information to an ambiguous question (65. p. 4).

Questions should neither be too universal nor too general. For instance: "Where is Chicago?" may bring out the answers—'In Illinois,' 'on Lake Michigan,' 'in the United States,' etc. All these answers have equal value for such a question.

All these vague questions admit of several equally good answers, according to the different points of view from which different minds regard them; but many teachers think that what is clear to them ought to be equally clear to others, so that when an answer is given contrary to their expectation, it is rejected, even though a perfectly legitimate one; while, if any pupil is fortunate enough to give the precise answer in the teachers' mind, he is commended and rewarded, even though he has given no more thought to the subject (21. p. 91). The really thoughtful and cautious child is merely bewildered by such questions. He remains silent and will be disgusted when an answer is given by his less worthy comrades. The second type is the pupil who is not very clever but shrewd as to the personal peculiarities of his teacher, watches her facial expressions, tone of voice, method and mode of questioning, etc., and discovers easily what she expects. The third type of learner takes a chance by answering at random without thinking it over. He is thus led to form a habit of guessing and insincerity.

Great simplicity of language is another condition. It is better to use as few words as possible, since the function of a question is not only to cause children to say as much as possible, but to avoid confusion, and a loose, pointless answer which is apt to result from a wordy question.

The questions should be adapted to the mind and experiences of the child. An intelligent teacher usually knows in advance which pupils can answer her questions, and this makes possible adaptation of the questions to the pupils. But, unfortunately, it too often happens that a teacher tries obstinately to elicit from the pupil's mind what is not in it. Whenever the question fails to fit the mind of the learner, it presents difficulty after difficulty, and causes embarrassment and confusion, which will cause some pupils to give up all attempts to reply and lead others to imitate their comrades or to reply at haphazard.

One girl says: "When I was in the eighth grade, our teacher used to ask such bewildering questions that most of the class could not understand, but she insisted upon our thinking until we hit upon what she had in her mind. If we did not at once hit upon her thought, her eyes became large and black, her voice harsh and her manner

made us feel as though we were the most unintelligent beings possible and as a consequence we became nervous, and gave up any attempt to solve or answer the questions." Examples of such bewildering questions can be found in many educational writings, and we cite a few of them here. Betts says: One teacher asked, "Which phenomena of the fratricidal strife in the American Republic were most determinative of the ultimate fate of the nation?" While in an elementary history class, another teacher propounded this question: "What American institutions have been founded on the principle of social democracy?" (4. pp. 66-67.) Now in all these questions not only the terminology, but the thoughts also are beyond the comprehension of the children. Such questions are not only useless, but confuse and discourage the children, and cause them to lose interest in study. How difficult it is to adapt questions to children is clearly seen from the following examples given as a model by a college professor in one of the largest American universities: "How long do you think it would take a man to walk to the top of a mountain? What would be the difficulties in getting to the top? If you stood on the top and threw a stone, how far down the mountain do you think it would go?" To the writer who was brought up among the mountains, such questions sound nonsensical.

Undoubtedly with many pupils under the conditions created by a series of ill-adapted questions, the brain becomes inhibitive or a storm center of opposing nervous impulses and the mind loses all docility. The following investigation may throw some light upon this point. In 1909, Miss Helen Todd (67. pp. 73-74) took 500 children from twenty different factories and asked them the question: "If your father had a good job and you didn't have to work, which would you rather do—go to school or work in a factory?" Four hundred and twelve said they would rather work in a factory and gave among others the following reasons: "Because it is easier to work in a factory than it is to learn in school;" "You never understands what they tells you in school, and you can learn right off to do things in a factory;" "They ain't always picking on you because you don't know things in a factory;" "It's so hard to learn;" "I couldn't learn;" "When you works a whole month at school, the teacher she gives you a card to take home, that says how you ain't any good."

These cases might be diminished by well-adapted questioning which will give a child success and hence pleasure and an incentive for further attempts. Every teacher has noticed with what enthusiasm and vigor children take up different tasks in their school lessons after they have been successful in the solution of some problem. "Not all the coaxing, or scolding, or moralizing in the world would fit them half so well to take up the new work, as the victory already won" (12. p. 112). Belief in power begets power, in weakness, begets weakness. Upon self-confidence depends the mental development of the child (47. p. 267). Hence it is important for mental hygiene

to give children a chance for success, and to arouse self-confidence in their ability; and this is the very task of questioning. It goes without saying that it is also important to allow a slight failure once in a while as a specific medicine. Meumann illustrates the importance of the self-confidence of a child in his own power from the experience of a boy whom he knew.

When a thirteen-year-old boy entered a new school, his previous teacher who had an antipathy to him, introduced him to the new teacher in a tactless manner with false report. From that moment the boy, who so far had done work above the average, could do nothing more, his intellectual efforts diminished from day to day, behavior deteriorated, and he became shy and depressed. At the end of the year he failed to be promoted, and would have gone to pieces, had not his parents taken him away. In the new school he met a teacher who showed confidence in him, and from that moment he changed completely, and left the school as one of the best pupils. Meumann gives this case as typical in that a single definite volitional inhibition entering into the life of the child, extended to his whole inner nature, discouraged his self-confidence, depressed his affective life, and decreased all his performances intellectual as well as moral (42. p. 298).

The effectiveness of such a volitional inhibition is most easily observed in the psychological laboratory-tests on immediate retention (42. pp. 298-300). We cite also one of our questionnaire returns.

A girl writes: "Behind the teacher's tones and expressions I have usually been able to read her attitude to the class and towards myself. When I know that a teacher has entire confidence in me and expects a certain response on my part, the most difficult subject becomes easy to me. On the other hand, when a glance tells me that my ability to answer is questioned, no matter how carefully the lesson has been prepared, my power over the subject seems to depart, and I fail in general."

Children are very susceptible to such volitional inhibitions; and such an inhibition is too frequently caused by ill-adapted questions which simply bring about failure after failure, or by the unsympathetic sarcasm of the teacher or the like.

Questions Should Not Be Numerous

A multiplicity of questions is likely to discourage and fatigue children because of the monotony of the procedure. According to Stevens' investigation, already referred to, the number of questions in one recitation period is, on an average, 85.3 for English, 81.2 for History and 81.4 for Science. That is, the children are asked about two questions per minute. Embarrassment, repulsion, constraint, weariness, etc., will often be the outcome of such a method of numerous questions,

as the following excerpt illustrates: "There is one teacher who asks question after question and does nothing else for a whole period; and everything becomes monotonous and one feels really wearied so that one can not understand what is going on." Another girl says: "As a result of too many questions we become indifferent;" still others say that they become nervous and impatient.

Effectiveness and leadership in social life depend on the ability to express one's self adequately on the topic under consideration. But in the schoolroom the number of questions, whether good or bad are apt to be so large that there is no time left for complete expression of thought. The pupils are allowed merely to punctuate the questions with monosyllabic answers, or with a few words. The following example from a lesson on "The Lady of the Lake" will illustrate the point (65. pp. 38-42, 66). The number of questions asked in one recitation period was 105 out of which 60 were answered with less than five words:

T. We will see; hold your judgment until the end, and see. How much is description used in the story, Mr. J.? Is there very much?
P. Quite a little.
T. For what did it seem to be put in?
P. I think one place the Canto starts very quietly, and then the clan gathered in the fiercest preparation, terrible oaths, shows contrasts.
T. Is it put in then, just as a scene, or for some distinct purpose?
P. Distinct purpose.
T. And in this case it was?
P. Contrast.
T. What other descriptions?
P. Nature.
T. Very much space taken up with descriptions of nature?
P. Yes.
T. Have you a pretty fair idea of the country?
P. Yes.
and so on.

The questions should be made so that every child may have frequent incentives to answer in well-articulated sentences. Dr. Lay says (32a. pp. 303-4) that "too great emphasis has been put upon questioning without thinking, that in the schoolroom is fostered a form of conversation that has an analogy in the court room alone. He further says: "The natural form of conversation should be preserved in the schoolroom, especially, since the question is unpleasant or even painful to most children. The child must have freedom to follow his own thought process, not that of the teacher." And for this purpose, description, narration, and exposition, or in other words, the method of our spontaneous report is very desirable. We are, however, by no means inclined to

slight the questions and questioning, but simply to guard against the use of too many fragmentary questions. An interchange of all these methods of description, exposition, narration and good questions contributes to freshness and interest. It is, of course, too much to demand a complete sentence for every question, and again it is pedantry to banish all questions that can be answered by "yes" or "no." We need, however, to be sure that a sufficient reason follows or precedes the answer, so that the 'yes,' or 'no' may neither be a mere guess nor an automatic expression.

Here it may be worth noting that the teacher who accepts vague and indefinite answers incidentally encourages slovenly habits of thought and fosters guessing. A child is quick to take advantage of the teacher who will accept any sort of an answer and interpret it as a statement containing thought. Indeed, a child may even come to think that his incoherent statements, his word juggling, really represent thought (66. pp. 110-111). Worse than this is the danger that a teacher may lead the child to insincerity of speech. Instead of truth, he will have appearances; instead of real powers, presumptuous weakness; instead of sincerity, hypocrisy.

Again, it seems even better to permit the pupil to blunder through to the end of his recitation and correct him than to disturb him in the midst of his speech.

A Normal School girl says: "A certain teacher I once had was very impatient. Before I would go to the room I would know the lesson almost word for word. When she called on me to recite, if she did not interrupt me, I could finish the recitation, but as soon as she began to ask many questions and then scold if they were not answered correctly, I would forget the work which I had before known so thoroughly, and as a result would fail." (Thirteen cases.)

Moreover the method of numerous questions means that things and their qualities are torn apart, retailed and detailed, without reference to their more general character, and thus the child is not only hindered from seeing the "forest on account of the trees," but also the firm retention of the subject-matter is rendered very difficult (20. p. 97).

Time Should Be Given for Answering

Rapidity in questioning intensifies the attention of children to great advantage and is undoubtedly necessary for pedagogical purposes, but its dangers should not be overlooked.

First of all, speedy questioning emphasises the quantity instead of the quality of the work. When a teacher demands of each pupil to answer quicker than the other for the sake

of a brilliant showing, a premium is put upon feverish activity, regardless of the cost to the pupils. According to the experimental results of Hillgruber (1), Rusk (52), Meumann and others, under the compulsion to work as quickly as possible, the amount of work will be far greater than that obtained without such force. Ach (1. p. 2) says: "It is due to the law of difficulty as motivation, that is, to the fact that the difficulty of a forced task motivates a more intense effort of Will and concentration of attention on the present problem." "With the increase of the difficulty," he continues further, "the effort of Will increases instinctively and acts in favor of the work quantitatively." But another aspect of their experimental results confirms our theory as well as Meumann's that under the influence of the compulsion to work as quickly as possible the quality of the work deteriorates. This is certainly due to the interference of association caused by excitement, confusion, lack of time, etc. It is obvious that sufficient time is needed to comprehend the questions correctly and to make correct comparison, discrimination, and true inference as well as call forth right associations or to make orderly associations with the old. The child needs a longer time for individual ideation, and the ideas with which the child works are not at prompt disposal for him in spite of his accurate possession (42. p. 231).

Meumann found from his experiments that when rapidity of response is a controlling factor, a stimulus word is comprehended in the most cursory fashion, so that the reproductions are of little value, but with lengthening of the reaction time in general is noted an increase of the qualitative value of the work. He concludes that for tests with a problem to be solved, the instruction "as quickly as possible" is detrimental (42. p. 232). The results of Rusk indicate that for different children the speed of association has little value as an indication of the intelligence of the learner (52. u. 102). The children who reply most quickly are not necessarily of the highest intelligence. An exceptionally good memory is often found to co-exist with very low intelligence (52. p. 151).

On the other hand, Müller and Pilzecker, and Bigham (5. p. 458) also, found that right associations are reproduced more quickly than false; in other words, those ideas which can be reproduced easily are usually truer than those whose recall is difficult, whether this be due to pure forgetfulness or to the confused association with kindred ideas. This again shows that questioning should not be too speedy, since speedy

questioning will overlook the false association that should be corrected and cleared.

The experimental results of Franken (22. pp. 239-243) tell us that the lengthening of the time for reflection (*Bedenkzeit*) brings about a quantitative increase but a qualitative degeneration, since the increase of right answers is smaller than that of false ones. This result apparently contradicts our theory, but a closer study shows that there is no conflict, but agreement. In Franken's experiment, the observer gave only those answers that were most clear and certain to him, and with the brief interval for reflection, all doubtful answers are rejected. (22. pp. 227-229.) Furthermore his result shows, that the mean variation varies with the length of the time for reflection; it increases if the time is lengthened and decreases if this is shortened; that recollection needs a certain time, and if, before its process is complete, questions and hence ideas and answers, crowd themselves in consciousness, the recollection will be disturbed and hindered (22. pp. 227-9; 241).

Second: rapid questioning ignores individual differences (59. p. 215), and consequently fosters shallow thinking or guessing. What one pupil solves in a second, another may spend a minute in solving (3. p. 243). Meumann says that: "The concrete thinking of a child is surprisingly slow; in some cases, he takes almost ten times as long as the adult to respond to a stimulus equally familiar to both" (42. pp. 227-8). Children who are more ambitious are apt to answer more quickly than others. Temperament also makes a great difference. The results of Rusk's experiments also disclosed great individual differences in the rates of reaction. For example, an investigation with three boys of the same age and intelligence revealed the fact that one of the boys invariably took three times as long as the other two to respond to the stimulus words. The work presented no difficulty, yet his normal rate of reaction was considerably slower (52. pp. 102-3). The teacher of these three boys, although they had been under his care for years, was unaware of any such difference, and probably, in oral questions, this boy owing to his slower rate of response, would appear at a disadvantage (53. p. 837). Bader (3. pp. 102-104) obtained similar results, among his five observers those whose reaction-time was shortest gave the poorest answers.

Furthermore, what effect does a demand to answer "as quickly as possible" have upon the mind of the child? Bader's experiment teaches us that the observer focuses his attention on the act of answering quickly as a result of

pressure. Thus those whose natural disposition forces them to a quick reply are still more incited by the stimulus and give flippant, unconsidered answers, while those who are by nature reflective feel in the procedure an unaccustomed impulse (3. pp. 243-4). In both cases, as a result, quickness of solution takes place at the cost of quality. To make these results clear, let us cite a few introspective reports of Bader's observers: observer E says: "The task of replying quickly influences consciousness and drives me to do so." Observer F says: "The idea, 'you must reply as quickly as possible,' is always very vivid and governs everything else." F further says "I do not know why I have said that word. Oh, yes, in an endeavor to answer as quickly as possible, I did not take time to give a sentence, but brought quickly merely a word." B says: "I would have answered differently. At all times I was clear that it (the answer) was false, but I thought that I needed too long a time to do otherwise; and hence I spoke so quickly" (3. p. 100).

Any demand for speedy reactions deprives a child of time for suspension of judgment and weighing the evidence pro and con; it prevents him from appealing to concrete experience latent in his mind, but encourages him to accept any suggestion from within as well as without and to react at random. As a result such a method may bring about mental automatism, a habit of instinctive, premature reaction. We should keep in mind that the class room is not a vaudeville stage for displaying or rehearsing the mere strength of verbal memory, but a laboratory for testing, getting, verifying, using and developing knowledge, in a word, for the training of purposive thinking.

It is the function of questioning to make children understand first of all the meaning of the question and to make an orderly association between the question and ideas in the answer. A question erroneously comprehended may not only evoke the wrong answer but may also cause an interference of association. Now it happens quite often that when a question is asked under the spur of answering quickly, many children raise their hands first and then think about the problem. The answers are given frequently before the question is fully understood. With frequency of such a mode of questioning and answering, the child may finally become habituated to a mode of thinking in which the attention, critical insight and examination of the inner process present between the question and answer is neglected.

From what has been said it follows that the rate or tempo of questioning should be carefully considered for different

ages and classes of children so as to allow just sufficient time for good reaction. (52. p. 104.)

It is a matter of course that when questions are put for the sake of drill or of the review upon memorized matter, they may be asked with emphasis and rapidity; but even then, the individual differences in reaction time and the influence of the command to answer "as quickly as possible" upon the observer should be kept in mind.

A large number of rapid questions is injurious both to mind and body. As Stevens says, "a large number of rapid questions keeps children in a highly strung nervous tension where there should be natural and normal conditions (65. p. 171). It is certainly injurious to the nervous organism to live in such a high-pressure atmosphere."

One girl says: "One of my teachers by her mode of speedy questioning causes me to put all of my mental powers on the questions in hand. After spending an hour with that teacher I feel really tired and nervous so that I can not do anything until I have time to recover from my nervousness."

Another girl reports: "There is a teacher who affects me very much. When I enter her room I am as calm and composed as anyone else should be, but when I leave it I am worked up to such a nervous pitch that I am almost unable to go on with the work of the next hour. It is caused, I believe, by the teacher's incessant calling upon us for answers and recitations." (Seventeen cases.)

Some individuals can do mental work with far less waste of energy than others even under pressure, but most of us are apt to be made nervous and excitable by undue nervous stress. In some cases, excitement, fatigue and anxiety may cause the beginning of pathological neuroses.

A girl reports: "At one time I had a teacher who was extremely nervous. When she called on her pupils for answers and recitations, she hardly gave them time to recite or answer by calling for answers, but she would supply words; and just by her whole manner and her mode of questioning she made her pupils so nervous that some forgot everything they knew, some became restless and some of my classmates gave way even to the nervousness in spells of crying."

It is especially noteworthy that this speedy habit of reaction and thinking formed by such a method may persist even till late in life and hinders the victim from quiet, deep, and connected thinking.

Some teachers may say that the ability to concentrate attention on a problem should be cultivated, and hence speedy questions must be used. It is certainly true that the attention of a child is very likely to be dulled by even a few minutes' exposition and that it is aroused by animated questions; but we must not forget that a multiplicity of speedy questions also tires and disgusts the children. After a few minutes,

their attention again flags; they will no longer listen to the inquiries of the obstinate questioner, and they will answer only at random, thanks to the defensive mechanism of nature. Hence the method of rapid questioning will rather kill than form the habit of attention. Attentive moment and relaxation-moment should alternate. Above all, it is desirable that attention be paid to the meaning of the question and to the quality of an answer, not to the form of the question nor to the teacher.

Too slow questioning is, however, detrimental for the education of the will (1, pp. 3-4). The best method may, as Ach suggests, be to let children work at times under the spur of obtaining good results as quickly as possible but with intervals of relaxation. This method conditions an increase of the effort of the will and brings about the best result both qualitatively and quantitatively (1. p. 3).

Still another point to be considered is that sometimes even the brightest children and some adults too fail to answer in spite of knowledge, when asked a question suddenly, unexpectedly, or at an examination. The writer's own experience and observation show that such a question causes a sudden arrest of psychic activity, or that there arises out of unconscious complexes an apparently unrelated idea. Thoughts refuse to flow freely, only to lead one to an utter failure, even when well prepared in the subject. The nerve centres for the time seem paralyzed; as soon as one is alone or with a sympathetic friend, the obstruction gives way, and clear-cut correct answers which he might have given in reply to the questions raised are readily thought of.

Psychologically such a sudden mental arrest may be due to fear, excitement, a feeling of unpreparedness, lack of self-confidence, timidity, shyness, embarrassment, or excessive ambition.

Whatever the cause may be, the fact remains the same. It is absurd to judge children's mental ability through the answers to such questions. Moreover a failure may injure their future work through volitional inhibition.

In conclusion it may be wise to add that for individuals who have a normal nervous system, adequate nutrition and abundant rest, and especially plenty of sleep, excitement and explosion of energy once in a while may be as essential as rest and the storing of energy. Normal children must be trained to work occasionally under pressure so as to be prepared for the struggles of their future life. To shield pupils entirely from tests of strength is to rear them in weakness and timidity (44. p. 118).

Finally, the limits which should be observed in the rate and tempo of questioning and in regard to the functions of questions in general, that they may be useful and not harmful to mental development are problems to be studied seriously by every teacher.

Conclusion

Experimental evidence from our own investigations and those of others give the following tentative results:

1. Children attempt the *Bericht* with a different mental attitude from what they have toward the *Verhör;* for example, some children reported correctly in the *Bericht* what they answered wrongly in the *Verhör,* while other children make false statements in the *Verhör* in regard to what they reported correctly in the *Bericht.*

2. The weakness of the *Bericht* seems to be the outcome of three factors. (1) Pedagogically, it appears to be due to passivity of the mind induced by habituation to the questioning method and lack of initiative. (2) Psychologically, it may be due to interference or weakness of association that children fail to recall in the *Bericht* what they can by the aid of questions. (3) It is undoubtedly in part due to the fact that children's interest is not equally distributed to each detail, and hence they fix their attention on the more interesting facts.

3. The large number of errors in the *Verhör* is due not only to the passivity of the mind and the suggestive character of the questions, but also to the fact that children's mode of viewing things is wholly different from that of adults, while the questions are asked from an adult point of view.

4. The experimental results show that many children can do better in the *Bericht* than in the *Verhör.* In view of this fact is it justifiable to determine the grade of children by the questioning method alone?

Summary of Practical Inferences

1. The *Bericht* is far more trustworthy than the *Verhör,* but the range of the former is far smaller than that of the latter.

2. Either method is defective for testing children; both should go hand in hand.

3. All questions, whatever their form, have a suggestive influence; and hence children should be trained to guard against suggestion and to react to the content and not the form of questions.

4. Children are suggestible to external as well as internal stimuli. They should be trained to withstand unfortunate suggestions.

5. Children should be trained to formulate questions themselves on what they have to learn or have learned.

6. All questions, except those for drill and experimentation, should be for purposive thinking.

7. The rate and tempo of questioning should be regulated according to the subject matter and the individual differences in reaction time.

8. The number of questions should not be too numerous.

9. Questions should neither be too difficult nor too easy, but well adapted to the pupil's mind.

10. Questions should be clear and logical.

11. They should be given in few words.

12. Vague, indefinite, and fragmentary answers should not be accepted.

13. If possible to avoid it, an answer should not be interrupted.

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APPENDIX

The questions used in the experiments described above are based on the section (p. 259) on the Guianas in C. C. Adams' Elementary Geography and the section (pp. 18-19) on the Surface of South America in A. E. Frye's Grammar School Geography. "The Guianas: The three Guianas (B. D. and F.), are mainly devoted to the growing and manufacture of cane-sugar and its by-products, rum and molasses. Cultivation is confined almost wholly to a narrow coast strip, where most of the people live. Owing to the decline in the price of sugar the British and Dutch planters are replacing sugar-cane to some extent with coffee and cacao. An important amount of gold is mined in the interior, the British producing the larger part of it. Georgetown and New Amsterdam, the chief towns of British Guiana, owe their importance to the palmy days of the sugar trade. Great Britain and the United States take nearly all of the exports of this colony—sugar, gold, rum, rubber, rice, and molasses. Great Britain supplies half and the United States one fourth of the manufactures, food, and coal imported. Paramaribo is the commercial center of Dutch Guiana, nearly all of whose trade is with the Netherlands. French Guiana (port, Cayenne) is less developed than the other colonies, and includes phosphates among its exports. Its trade is mainly confined to France."

A. Tell what you know about the colonies of the three Guianas. (For the *Bericht.*)

B. Series of questions for the *Verhör:*

1. To what manufacture are the three Guianas mainly devoted?
2. What by-products are obtained from that manufacture?
3a. Do most of the people of the Guianas live along the narrow coast line?
3b. Do most of the people of the Guianas live in the interior?
4. What are the British and Dutch planters planting in place of the sugar-cane?
5. Why do they do that (referring to question 4)?
6a. Is an important amount of gold mined in the interior?
6b. Is an important amount of gold mined on the coast line of the Guianas?
7a. Does British Guiana produce the larger amount of gold (than the other Guianas)?
7b. Does British Guiana produce the smaller amount of gold (than the other Guianas)?
8. Mention the names of the chief towns of British Guiana.
9. To what do those towns owe their importance?
10a. Is the cultivation of the sugar-cane confined almost wholly to a narrow coast line?
10b. Is the cultivation of the sugar-cane confined in the interior of the Guianas?
11. What products are exported from British Guiana to Great Britain and the U. S. A.?
12. What things are exported from French Guiana?
13a. Isn't French Guiana less developed than the other Guianas?
13b. Isn't French Guiana more developed than the other Guianas (other colonies of the Guianas)?
14. What things are imported from Great Britain and the United States to British Guiana?
15. What is the commercial center of Dutch Guiana?

16a. Isn't the trade of Dutch Guiana chiefly confined to the Netherlands?
16b. Isn't the trade of Dutch Guiana chiefly confined to the U. S. A.?
17. With what country does French Guiana mainly trade?
18. What is the chief town or port of French Guiana?

South America has the shape of a triangle towards the south. Its coast is not so broken as that of North America. In general the surface of South America resembles that of North America. Each has its greatest or primary highland on the west, with lesser highlands on the east, and a great plain between. The highland which lies along the west coast of South America is known as the Andes highland, or simply the Andes. It is not nearly so wide as the Rocky mountain highland, but it has much higher plateaus. Over the eastern part of South America spreads a low but broad plateau, not nearly so high as the Andes. This plateau is mainly in the eastern half of a country called Brazil and is known as the highland of Brazil. The western half of Brazil is part of the Central plain and contains vast forests called selvas. Most of the trees grow in the lowlands along the rivers that form the Amazon system. The Amazon river and its branches drain the largest river basin in the world. The selvas are in this basin. Most of the largest rivers of the Amazon system flow from the Andes highland. The part of the Central plain south of the selvas is grassy and supports millions of cattle and horses. In that land such grassy plains are called pampas. The parts of the Central plain north of the selvas are called 'llanos,' meaning level land. There also the people raise many cattle.

A. Tell what you know about the surface of South America. (For the *Bericht.*)

B. Series of questions for the *Verhör* are as follows:

1. What is the shape of South America?
2. Which part of South America is widest?
3. The coast of Australia is regular, that of North America is irregular. How is the coast of South America?
3a. Is the coast of South America less irregular than that of North America?
3b. Is the coast of South America as irregular as that of North America?
4. Towards what direction does South America taper?
5. In what part of the country does a great plain of South America lie?
6. Along what coast of South America does the primary or greatest highlands lie?
7. What is the name of that primary (or greatest) highland?
8. Compare the height of that primary highland of South America with that of the Rocky Mountain highland.
8a. Has not that primary highland much higher plateaus than the Rocky mountain highland?
8b. Has not that primary highland much lower plateaus than the Rocky mountain highland?
9. Compare the width of that primary highland with that of the Rocky mountain highland.
9a. Is that primary highland of South America narrower than the Rocky mountain highland?
9b. Is that primary highland of South America as wide as the Rocky mountain highland?

10. Over what part of South America does a low but broad highland (or plateau) spread?
11. What is the name of that low but broad highland?
12. Why is it so called?
13. South America has highlands and lowlands. Where do most of trees grow there?
13a. Do not most of the trees in South America grow on the lowlands?
13b. Do not most of the trees in South America grow on the highlands?
14. How large is the Amazon river basin compared with the other rivers in the world?
15. From what highland do most of the largest rivers of the Amazon system flow?
16. What country has a surface very similar to that of South America?
16a. Does the surface of South America differ from that of North America?
16b. Does the surface of South America resemble that of North America?
17. Locate the grassy plains of South America.
18. What is the grassy plain of South America called?
19. In what regions are most of the cattle raised in South America?
19a. Do the people of South America raise many cattle on the plain?
19b. Do the people of South America raise many cattle on the highland?
20. What part of South America is called 'llanos?'
21. What does 'llanos' mean?
21a. Does not 'llanos' mean highland?
21b. Does not 'llanos' mean level land?
22. What are the vast forests in Brazil of S. A. called?
23. In what river basin are those vast forests?
24. Which half of Brazil is a part of the central plain?
24a. Is the western half of Brazil a part of the central plain?
24b. Is the eastern half of Brazil a part of the central plain (of South America)?